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SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS. VOLUME III.--ETC(U)
JAN 79 E S LINDOW
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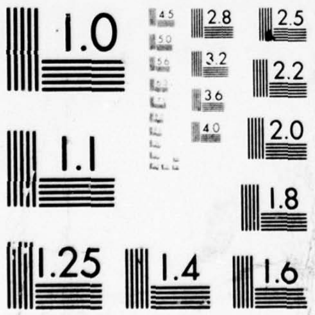

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TECHNICAL REPORT M-253
January 1979

SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS
VOLUME III: LIFE2 PROGRAM LISTING

LEVEL III

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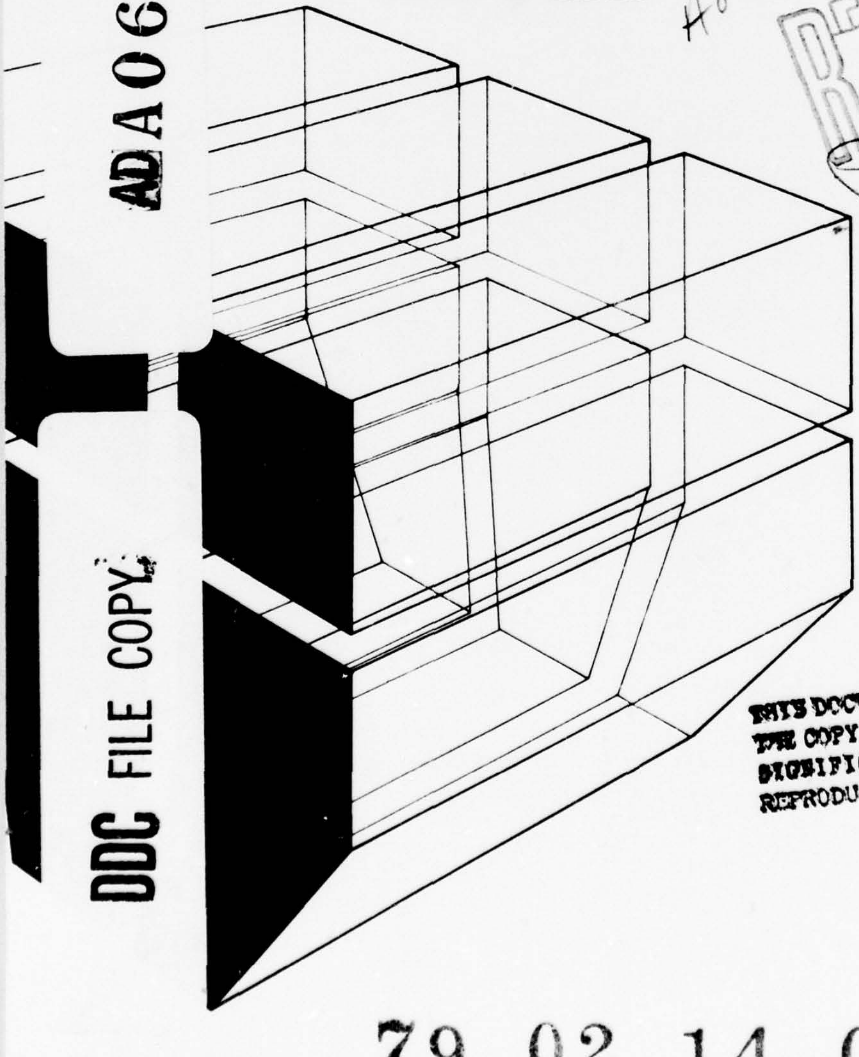

by
E. S. Lindow

CERL

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report is the third volume of a three-volume report which documents an automated system (LIFE2) for analyzing pavement designs and maintenance and repair strategies based on life-cycle costs. LIFE2 models existing Corps of Engineers criteria for designing rigid and flexible pavements for airfields, roads, and streets. The program includes analytical procedures for evaluating earthwork, drainage, and → CONT

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frost protection requirements in addition to maintenance costs. The resulting combinations of design schemes and maintenance strategies are ranked by total cost over the design life of the pavement.

Volume I is the LIFE2 Users Manual, Volume II is the LIFE2 System Documentation, and Volume III is the LIFE2 Program Listing.

FOREWORD

This work was conducted as part of the RDT&E Army Program 6.37.34A, Project 4A763734DT08, "Military Construction Systems Development," Task 01, "Military Airfield Facilities," Work Unit 001, "Systems Approach to Life-Cycle Design of Pavements." The Technical Monitor was Mr. E. Dudka, DAEN-MPE-T, Advanced Technology Branch, Engineering Division, Military Programs, Office of the Chief of Engineers.

The work was conducted by the Engineering and Materials Division (EM), U.S. Army Construction Engineering Research Laboratory (CERL). The CERL principal investigator was Mr. E. S. Lindow. The LIFE1 computer program was developed by Drs. P. F. McManus and E. L. Marvin. Mr. J. J. Brown was responsible for programming and operation of LIFE2.

Dr. G. R. Williamson is Chief of EM. COL J. E. Hays is Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.

CONTENTS

SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS VOLUME III--LIFE2 PROGRAM LISTING

1 INTRODUCTION

Background

LIFE2 is a digital computer program devised as an engineering aid to pavement designers and managers. The program includes analytical procedures for designing rigid and flexible pavements and for evaluating various maintenance and repair strategies. The resulting combinations of design schemes and maintenance strategies provide the pavement manager with life-cycle alternatives.

In the early 1970s, CERL began developing an automated system for designing airfield pavements based on life-cycle cost comparisons. The first iteration of this computer system, designated LIFE1, included procedures for (1) performing rigid flexible pavement and overlay designs for airfields, (2) analyzing costs and maintenance and repair costs on a macro scale, and (3) combining design schemes and maintenance strategies into life-cycle rankings.[1,2]

Subsequently, the system was expanded to include life-cycle design of pavements for roads, streets, and other surfaced areas. This second iteration, LIFE2,[3] also included procedures for considering maintenance costs on the basis of individual M&R activities, thereby making the system more responsive and efficient in terms of data available to the user. Frost protection design criteria were computerized and incorporated into LIFE2. In addition, since earthwork and subsurface drainage costs vary with the pavement thickness design selected, automated procedures for considering these costs were included as optional analyses for the user.

LIFE2 was field tested in 1976 at the Corps of Engineers' Fort Worth District Office. Based on results of the field test and recent updating of the pavement design criteria employed, minor modifications

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[1] E. Marvin and P. McManus, *Life Cycle Analysis of an Airfield Pavement Facility.* Unpublished Report (Construction Engineering Research Laboratory [CERL], 1972).

[2] J. Willmer, et al., *User Manual for LIFE1 Computer Program,* Technical Report S-28/AD774849 (CERL, January 1974).

[3] E. S. Lindow, et al., *LIFE2 Users Manual*, Technical Report C-59/ADA023186 (CERL, January 1976).

were made in the LIFE2 system. LIFE2 is now an implementable tool which can help pavement managers optimize expenditures by basing decisions on life-cycle costs, rather than solely on the least first cost.

Objective

The objective of this research is to develop and validate computer-aided procedures for performing life-cycle design analysis of pavements. These procedures will help facilities select the most economical pavement objectives, based on total cost over the life span of the facility.

Approach

The computer program LIFE2 is based on Corps of Engineers pavement design methods and criteria. In amalgamating the manual procedures into an automated system, certain deviations and additions were necessary; however, for identical conditions and design lives, pavement structural thickness designs by LIFE2 will be comparable to the manual procedure.

LIFE2 is written in FORTRAN extended* for CDC 6000 series computers. It currently operates on the CDC 6600 computer and uses the NOS/BE control language. Because of the magnitude of the analytical procedures employed, the system was structured using program overlays. Figure 1 illustrates the overlay structure.

The Appendix provides the compiled listing for LIFE2. This listing includes full cross-reference maps. Table 1 is an alphabetical index of appendix page locations for all routines in the program.

Mode of Technology Transfer

The LIFE2 system was developed principally as an engineering tool for use by Corps of Engineers District Office personnel. Access to the LIFE2 program for Corps of Engineers personnel will be through the Corps' Engineering Computer Program Library (ECPL).** Figure 2 illustrates the accessing procedure. For other users, the program and relevant documentation is available from National Technical Information Service.

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*The sole exception is the routine COMPASS which is written in COMPASS assembly language.

**ECPL is located at the U.S. Waterways Experiment Station, Vicksburg, MS.

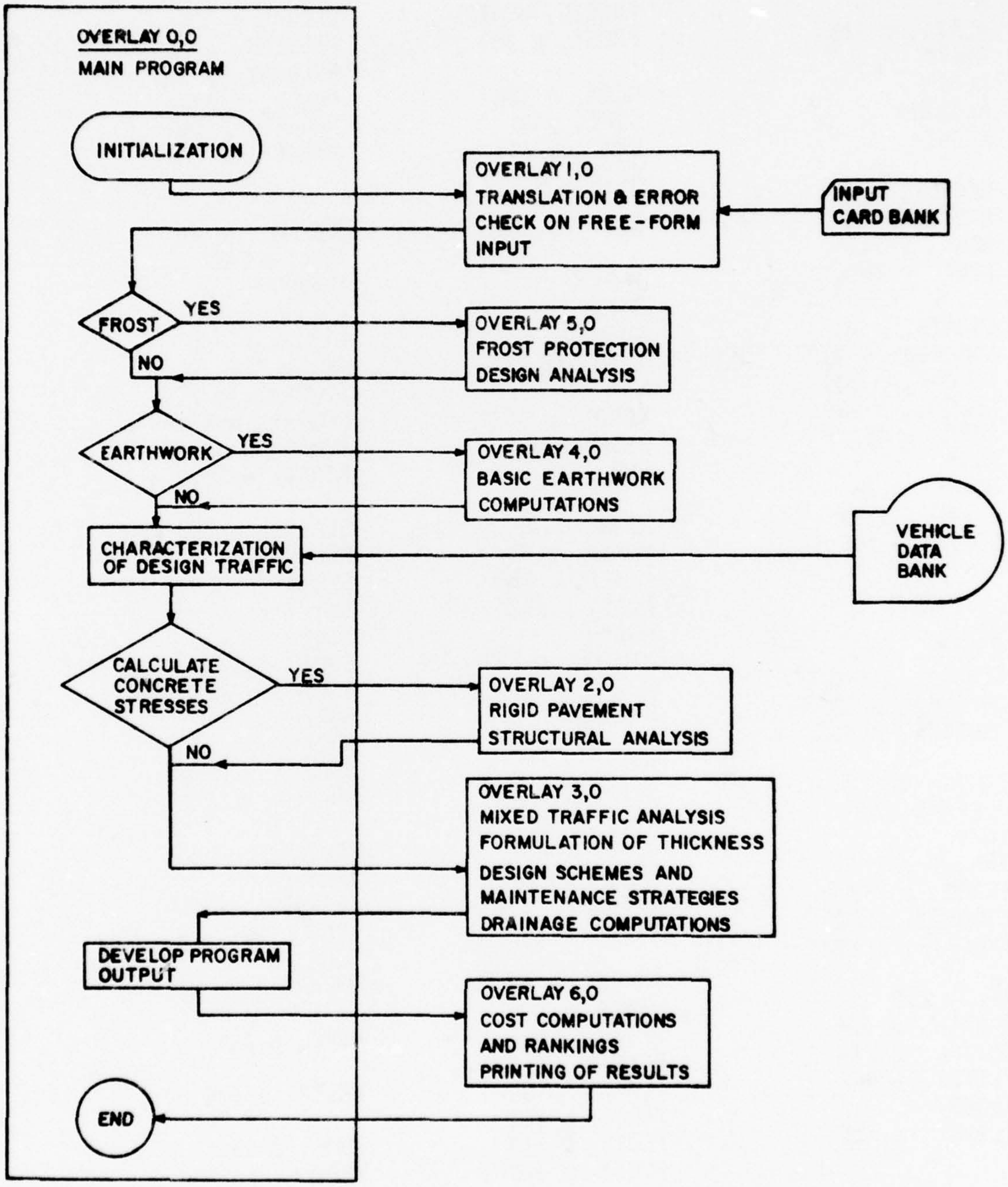

Figure 1. Framework of LIFE2 program overlays.

Table 1

Routine Index

ABS*
ADATA, p 115
AUBT*
ALOG*
ALOG10*
AMIN1*

BACKUP, p 107
BASIN, p 40
BBRK, p 111
BTCT, p 263

CKDATA, p 76
COMPSUB, p 331
CONCAT, p 109
CONSEQ, p 209
COPY, p 42
COS*
COV5K, p 36
CTABLE, p 93
CURVE, p 146

DATE*
DINDEX, p 377
DRNAGE3, p 225
DRNAGE6, p 433

EARTH, p 272
ELEV, p 279
EOF*
ERN, p 122
ERROR, p 297
EXCOST3, p 223
EXCOST6, p 430

FF, p 236
FINISH, p 124
FLEXBL, p 244
FLEXB2, p 442
FLOAT*
FLXPET, p 378
FREEZE, p 347
FROST, p 343

GEOM, p 128
GINT, p 31
GXMT, p 191
GZCBR, p 195

HINT, p 189

IHBS*
IFIX*
INT*
INPUT, p 285

LPLOT, p 301
LSSP, p 112
LYR, p 173

MAIN, p 12
MDATA, p 74
MIXED, p 260
MOAC, p 252
MOD*
MTHICK, p 229

NXTPNT, p 304

OMIT, p 328
OUTA, p 379
OUTB, p 385
OUTC, p 388
OUTLNE, p 132
OVERLAY*
OVTHK, p 216

PACKET, p 44
PARSE, p 96
PAVE, p 151
PECHART, p 233
PLABAY, p 90
PLOT1, p 312
PLOT2, p 317
PLOT3, p 320
PLOT4, p 324
PREVENT, p 238
PREVEN2, p 439
PRICE, p 339
PROBRD, p 140
PURIFY, p 371

RDLINE, p 106
RDO, p 248
REMAKP*
RIGID, p 241
RIGI2, p 446
RL, p 402
RODDENS, p 231
RODTHK, p 235
RSUBG, p 375
RTN25, p 370

SEARCH, p 283
SECOND*
SERCST, p 270
SHIFT*
SIN*
SORT, p 29
SORTA, p 295
SORTD, p 292
SORT*
STPLT1, p 308
SUBPEN, p 367

TABINT, p 149
TAN*
TERAREA, p 277
TLMC, 199
TLMM, p 202
TMPAREA, p 302

USRC, p 257

XMSTR, p 204

ZONE, p 336
ZPRICE, p 341

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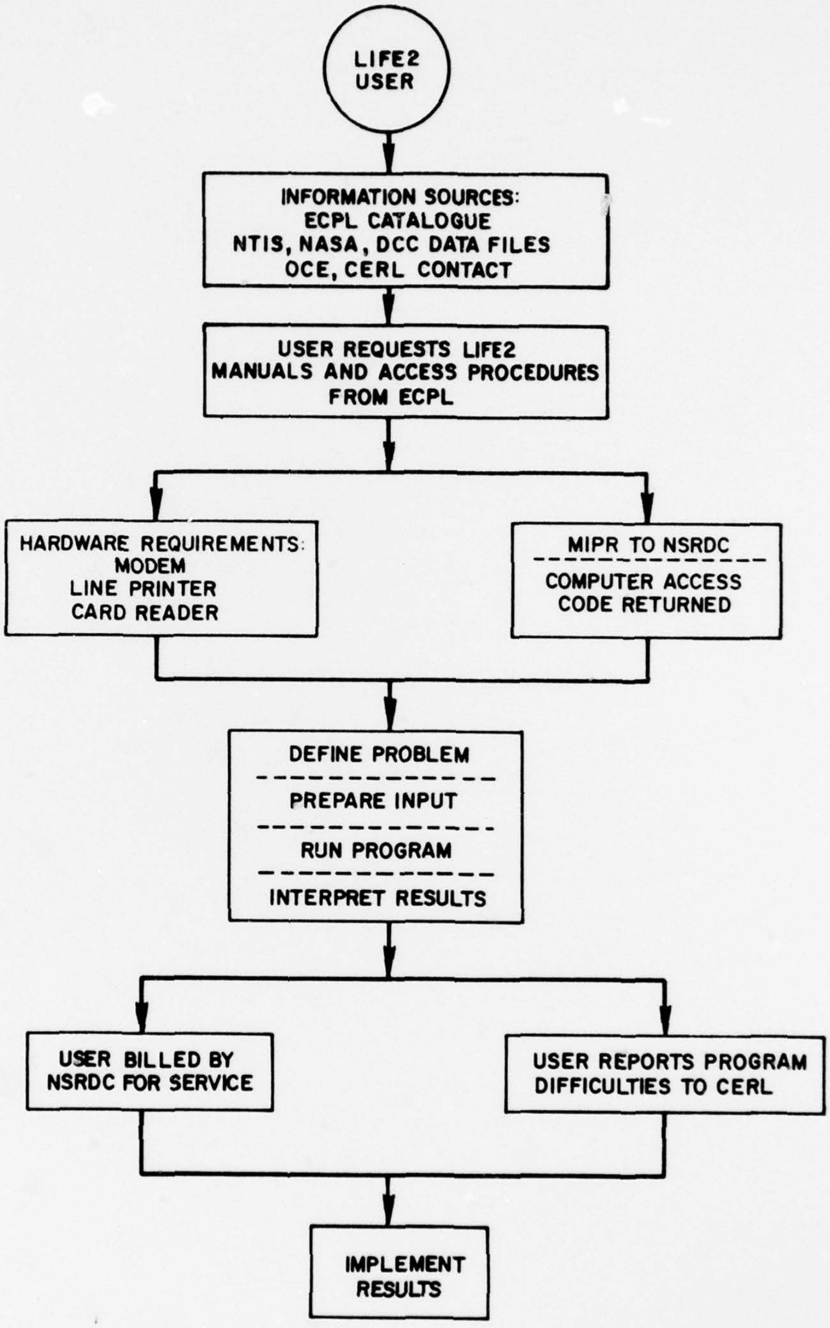
*Routine is supplied by CDC computer system and is not part of the LIFE2 program listing.



KEY:

ECPL-CORPS ENGINEERING COMPUTER PROGRAM LIBRARY
MIPR-MILITARY INTERDEPARTMENTAL PURCHASE REQUEST
NSRDC-NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, BETHESDA, MD.
NTIS-NATIONAL TECHNICAL INFORMATION SERVICE

Figure 2. Flowchart of LIFE2 access procedure.

APPENDIX:

LIFE 2 PROGRAM LISTING

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```
      OVERLAY(LIFE,0,0)
      PROGRAM MAIN(OUT1,OUT2,OUT3,OUT4,OUT5,OUTPUT,INPUT,SF2,SF3,SF5,SF7
     1,ADATA,TAPE1=INPUT,TAPE2=SF2,TAPE3=SF3,TAPE4=OUT4,TAPE5=SF5,TAPE6=
     2OUT2,TAPE7=SF7,TAPE8=OUT1,TAPE9=OUT3,TAPE10=ADATA,TAPE11=OUT5,OUT6
     3,TAPE12=OUT6)
C     THIS PROGRAM IS FURNISHED BY THE GOVERNMENT AND IS ACCEPTED AND USED BY
C     THE RECIPIENT WITH THE EXPRESS UNDERSTANDING THAT THE UNITED STATES GO-
C     VERNMENT MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, CONCERNING THE ACCUR-
C     ACY, COMPLETENESS, RELIABILITY, USEABILITY, OR SUITABILITY FOR ANY PARTI-
C     CULAR PURPOSE OF THE INFORMATION AND DATA CONTAINED IN THIS PROGRAM OR
C     FURNISHED IN CONNECTION THEREWITH, AND THE UNITED STATES SHALL BE UNDER NO
C     LIABILITY WHATSOEVER TO ANY PERSON BY REASON OF ANY USE MADE THEREOF.  THE
C     PROGRAM BELONGS TO THE GOVERNMENT.  THEREFORE, THE RECIPIENT FURTHER A-
C     GREES NOT TO ASSERT ANY PROPRIETARY RIGHTS THEREIN OR TO REPRESENT THIS
C     PROGRAM TO ANYONE AS OTHER THAN A GOVERNMENT PROGRAM.
      INTEGER GBM
      DIMENSION ROAD(10),TRYF(20)
      DIMENSION  REPFL(10,2),REPRG(10,2)
      COMMON /ABLK/ A,AP(10),AH(10),AK(10),ASIG(10),AG(10)              M51A007
      COMMON/ABLK3/AKEFT(10),IFSWIT(10)
      COMMON /AKBLK/ AKEF(10),PAVT,BIG,TBS,AKY
      COMMON /AMBLK/ MXN,IBN
      COMMON /ARBK/ AREA
      COMMON /BLBLK/ IRL
      COMMON/BLOCKB/COMPF,COMPR,FCOMPF,FCOMPR,SLSDBIF,
     1    SLSDBTR,SLSPENF,SLSPENR,FLSF,FLSR,RSUBF,RSUBR,
     2    FRSUBF,FRSUBR,PRDBTF,PRFLTF,PRDBTR,PRFLTR,XTRA
      COMMON/BLOCKC/MSGSW1,IIPAVT,MESS(11),ISWITF,ISWITR,MSGSW2,MSGSW3
      COMMON/BLOCKD/PVTFLX,PVTRGD,IFLEXNA,IRIGDNA
      COMMON/BSBLK/IBTE,FDE,BTE,GBM
      COMMON/BSBLK2/FDEF
      COMMON /COND/ ICOND,ESC,DSC
      COMMON /CSTBK/ CCCST(50,10,2)
      COMMON /CUSR/ DLCF,DLCP
      COMMON /DMBLK/ TRST
      COMMON /DOBK/ ID,ITY,DT20,DT
      COMMON /DOM/ MNT
      COMMON /DRNBLK/DRNCST,DRAIN
      COMMON /DRNBLK2/IDGWTO,IDIPO,EPO,DLO,PERMO,H30,LENGTHO,CAVCSTO,
     1FILCSTO,PIPCSTO,SLO,RNO,NOUTO,LOUTO
      COMMON /FCON/ IFCON
      COMMON /FLAG/ JCOND
      COMMON /HBLK/ HH(10),TM(20),AHH(10)
      COMMON/IABLK/FACC,FACN,LT,IA
      COMMON/KAPD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
     1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
     2    ISUBHOR,BMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
      COMMON /KAYBK/ IAXK
      COMMON /LCY/ AXK,YK,TRY(20),FAC,LS,XCBR,XSTR
      COMMON/LTTBLK/LTT(10),IAA(10)
      COMMON /LYTD/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSBB,XMT(10,6),
     1NB,ZMT(3,4)
      COMMON /MANLK/ JMAN,MLYST,NYOO(20),JXX(20,20)
      COMMON/MIXBLK/STORE1(10,10),STORE2(10,10),COVRGD(10,20),IMIX,LR,JJ
      COMMON /MTO/OMTF,OMTR
      COMMON/MXBLK/IGINT,ICBR
      COMMON /NANLK/ NLYST
```

```
       COMMON/NBLK/ NOG.NOH.NPT.NX.NY.NOD.NOSG.XK
       COMMON /PQZ/ TRPQZ(20)
       COMMON /PRVNT/ICYCLE.FACTR1.FACTR2.FACTR3.FRSTSL.COSTR.NRG.REPRG.
      * IRG.  CRSL.PTCH.CLNDRN.JCYCLE.CLNSWP.SLCT.COSTF.NFL.REPFL.IFL
      * .SCLPOP
       COMMON /PRVNT1/ ISKIP.JISKIP.IVM
       COMMON /RDSTR/ IMAN.NUMS.NOO(10).CSTRT(10.6)
       COMMON /RESTR/ IREST.JREST.ICOUNT
       COMMON /RLMN/ JTYPE(3.10).NOACFT(50.10)
       COMMON /RL1/ K7.K4.EARTHWK.IDENT(3).FACTOR
       COMMON /RL2/ NAME(5).LOCATE(8).IDSCRPT(30.10).DSCRPT(3.50).CHAR(7.
      150)
       COMMON/RODLOD/IDR.L7.IDF
       COMMON /SA/ALOS.WOS
       COMMON /SBLK/ SIGMA(10).S.SR
       COMMON /SCAN3/ JDL.NP.TRL(10).TCY(50)
       COMMON / SGSWP2 / XFP(20.10). NOGWT. NREX2.COVM(20). DCOM(20)
       COMMON /SUBK/ SUBD.IUBC.IDRY
       COMMON /S7BK/ MXTO.MNTO
       COMMON /THKBK/ THFF(20).TRKK(20)
       COMMON /TMPL/ IND.SWID.TWOCL.JACK
       COMMON/TSV/THCK.ERCOST.PSTEP.CUTPRCE.FILPRCE.NERTH
       COMMON /TYP/ NRIGID.NFLEX
       COMMON /TYPBK/ LMH.LFUNC
       COMMON/WES/ESWL(10.20).AESWL(10).WHEELS(10).CBR(20)
       COMMON /ZONES/ZONSTEP(9).APWID(9).APRSTR(9.3).APREND(9.3).NAPR.APT
      1OT
       DATA ESC.DSC /2*.0/.ICOND/1/
       DATA NCOM.NSBR.NB.NNAT.IMIX.K7 /6*0/
       DATA  ((CHAR(I.J).I=1.7).J=17.45) /  203*1H /.
      1(CCCST(I.1.1).I=1.50) /  50*0.0 /.DSCRPT / 150*1H  /
       DATA  ((CHAR(I.J).I=1.7).J=46.50)
      1           / 4HRIGI.4HD IN.4HITIA.4HL CO.4HNSTR.4H.    .4H    .
      2 4HRIGI.4HD OV.4HERLA.4HY SY.4HSTEM.3H    .8*1H .4HFLEX.4HIBLE.
      3 4H INI.4HTIAL.4H CON.4HSTR..4H     .4HFLEX.4HIBLE.4H OVE.4HRLAY.
      4 4H SYS.4HTEM ,1H    /
       DATA  ISKIP/1/.JISKIP/0/.IVM/0/
       DATA IAXK.IBTE/2*1/.IRL.IFCON/2*2/.MXN/10/.IBN/3/
       DATA DLCF/0./.DLCR/0./.IREST/1/.IDRY/1/.MXTO/30/
       DATA MNTO/1/.(TRL(I),I=1.10)/10*0./.EARTHWK/0./.APTOT/0./
       DATA (NOO(1).I=1.10)/10*0/.(CSTRT(I.1).I=1.10)/10*0./
       DATA JTYPE(1.1)/4H    /
       DATA ID.ITY.JDL.GBM.LMH.NRIGID.IUBC.MLYST.LFUNC/9*10000000/
       DATA ((JXX(I.J).I=1.20).J=1.20).(NYOO(K).K=1.20)/420*10000000/
       DATA BTE.XSTR.DT.HH(1).HH(10).XCBR.SUBD.XK/8*10000000./
       DATA ((STORE1(I.J).I=1.10).J=1.10).((STORE2(K.L).K=1.10).L=1.10)
      1/200*10000000./.IDR.IDF/2*0./
       DATA NFLEX.JMAN.JREST.NP/4*1/.IMAN/2/.FACTOR/1./.TRST/0./.AREA
      1/1000000000./.MNT/10000000/,((NOACFT(I.J).I=1.50).J=1.10)/500*0./
       DATA ((IDSCRPT(I.J).I=1.30).J=1.10).(IDENT(K).K=1.3).(LOCATE(L).
      1L=1.8).(NAME(M).M=1.5)/316*4H    /.OMTF.OMTR/4.0.5.0/
       DATA LS/6/.TM(1)/1./.TM(2)/10000000./.DRAIN.DRNCST/2*0./
    17 FORMAT(" SUBGRADE SOIL TYPE IS F1")
    18 FORMAT(" SUBGRADE SOIL TYPE IS F2")
    19 FORMAT(" SUBGRADE SOIL TYPE IS F3")
    21 FORMAT(" COMPLETE PROTECTION APPLIES FOR FLEXIBLE ANALYSIS")
    22 FORMAT(" PARTIAL PROTECTION APPLIES FOR FLEXIBLE ANALYSIS")
```

```
   23 FORMAT(" REDUCED SUBGRADE STRENGTH APPLIES FOR FLEXIBLE ANALYSIS")
   24 FORMAT(" COMPLETE PROTECTION APPLIES FOR RIGID ANALYSIS")
   25 FORMAT(" PARTIAL PROTECTION APPLIES FOR RIGID ANALYSIS")
   26 FORMAT(" REDUCED SUBGRADE STRENGTH APPLIES FOR RIGID ANALYSIS")
 1000 FORMAT (2X,20I2)
 1500 FORMAT(10F6.1)
 2000 FORMAT (2X,12F6.2)
 2500 FORMAT(5X," OVERLAY CALLED AT ",F10.4," SECONDS ")
 3000 FORMAT(2X,6F10.0)
 4000 FORMAT(6F10.0)
 5000 FORMAT(20I2)
 6000 FORMAT(2X,20(2X,I2))
 7000 FORMAT(1H0,10E11.4)
 8001 FORMAT(22H0WANDER IS CHANNALIZED )
 8002 FORMAT(24H0WANDER IS UNCHANNALIZED )
 8003 FORMAT(18H0AIRCRAFT NAME IS  ,3A4,/,16H PAST TRAFFIC =  ,F10.3,/,
     219H YEARLY TRAFFIC IS  ,/, 5(10I10,/))
 8004 FORMAT(10F10.3)
 8005 FORMAT(10I10)
 8006 FORMAT(20H0WANDER IS UNDEFINED )
 8007 FORMAT(30H0THIS IS A MAINTENANCE PROBLEM )
 8008 FORMAT(29H0THIS IS A LIFE CYCLE PROBLEM)
 8009 FORMAT(53H0PROBLEM TYPE UNDEFINED.  A DESIGN PROBLEM IS ASSUMED )
 8020 FORMAT(25H0THIS IS A DESIGN PROBLEM)
 9000 FORMAT("1   BEGIN OUT2(TAPE6)  " //)
9001  FORMAT(1H1)
9002  FORMAT(2X,////////////////////,55X,"PROGRAM LIFE2",//,52X,"LIFE CYCL
     1E ANALYSIS"//47X,"U.S. ARMY CORPS OF ENGINEERS"//,42X,"CONSTRUCTIO
     1N ENGINEERING RESEARCH LAB"//53X,"CHAMPAIGN, ILL."//)
9100  FORMAT(7F10.1)
 9800 FORMAT("1       TO AVOID RIGID STRUCT'JRAL ANALYSIS COMPUTATIONS FOR
     1THE FOLLOWING CONDITIONS"/9X,"VEHICLE.TYPE",8X,3A4/9X,"RANGE.OF.TH
     2ICKNESS",2X,F4.1,5X,F4.1/9X,"SUBGRADE.MODULUS",4X,F5.1/6X,"ENTER T
     3HE FOLLOWING STRESSES AFTER THE INPUT VARIABLE NAME"/9X,"CONCRETE.
     4STRESSES.ON.GRADE",6X,10F8.1)
 9900 FORMAT(/"       TO AVOID RIGID STRUCTURAL ANALYSIS COMPUTATIONS FOR
     1 THE FOLLOWING CONDITIONS"/9X,"VEHICLE.TYPE",8X,3A4/9X,"RANGE.OF.T
     2HICKNESS",2X,F4.1,5X,F4.1/9X,"CALCULATED ASPHALT MODULUS(FROM TM5-
     3824-3,SECTION 2 PAR. 16)",4X,F5.1/6X,"ENTER THE FOLLOWING STRESSES
     4 AFTER THE INPUT VARIABLE NAME"/9X,"CONCRETE.STRESSES.OVEP.ASPHALT
     5",2X,10F8.1)
      LP=1
      WRITE(8,9001)
      WRITE(8,9002)
      WRITE(6,9000)
      FDE=1.
      CALL SECOND(B)
      WRITE(6,2500) B
      CALL REMARK (15HENTER OVERLAY 1)
      CALL OVERLAY(4HLIFE,1,0,0)
      CALL REMARK(14HEXIT OVERLAY 1)
      IF(IBTE.NE.5.AND.IBTE.NE.6)  GO TO 473
      CALL REMARK(15HENTER OVERLAY 5)
      CALL OVERLAY(4HLIFE,5,0,0)
      CALL REMARK(14HEXIT OVERLAY 5)
473   CONTINUE
      IF(EARTHWK.LT.0.5 .OR.EARTHWK.GT.5.0)GO TO 474
      CALL REMARK (15HENTER OVERLAY 4)
      CALL OVERLAY(4HLIFE,4,0,0)
      CALL REMARK(14HEXIT OVERLAY 4)
474   IF(IFGRP.EQ.1) WRITE(6,17)
      IF(IFGRP.EQ.2) WRITE(6,16)
      IF(IFGRP.EQ.3) WRITE(6,19)
      IF(IFLEXNA.EQ.1) WRITE(6,21)
      IF(IFLEXNA.EQ.2.OR.IFLEXNA.EQ.6) WRITE(6,22)
      IF(IFLEXNA.EQ.4.OR.IFLEXNA.EQ.6) WRITE(6,23)
      IF(IRIGDNA.EQ.1) WRITE(6,24)
      IF(IRIGDNA.EQ.2.OR.IRIGDNA.EQ.6) WRITE(6,25)
      IF(IRIGDNA.EQ.6)                 WRITE(6,26)
      IGINT=0
      DO 40 JJ=1.IMIX
      CALL COPY(JTYPE(1.JJ))
      FAC= FACN
      IF(NP .EQ. 1) FAC= FACC
      WRITE(6,8003) (JTYPE(I,JJ),I=1,3),TRL(JJ),(NOACFT(I,JJ),I=1,JDL)
      WRITE(6,8004) XCBR,XSTR,XK
      WRITE(6,5000)IA,LT
      WRITE(6,6000) MXN.JDL.IBN,NOH,IMIX,IA
      WRITE(6,2000) SUBD,XCBR
      LTT(JJ)=LT
      IAA(JJ)=IA
      TR=0.
      TRF=0.
      DO 11 I=1,LS
      IF (I.EQ.1) GO TO 12
      GO TO 13
12    CONTINUE
      MMM=1
      GO TO 14
13    CONTINUE
      MMM=TM(I-1)+1.1
14    CONTINUE
      LLL=TM(I)+.1
      IF(NRIGID.EQ.0) GO TO 2
      DO 15 J=MMM,LLL
15    TR=TR+NOACFT(J,JJ)
      TRY(I)=TR
2     IF(LZ.NE.3) GO TO 11
      IF(NFLEX.EQ.0) GO TO 11
      DO 31   J=MMM.LLL
31    TRF=TRF+NOACFT(J,2)
      TRYF(I)=TRF
11    CONTINUE
      IF((IAXK.EQ.1).A.(LR.EQ.1)) AXK=3.*XK-50.
      IF(IAXK.EQ.1.A.LR.EQ.1.A.AXK.GT.212.5) AXK=XK+125.
      IF((IAXK.EQ.1).AND.(AXK.GT.500.)) AXK=500.
      WRITE(6,27)
27    FORMAT(" MAIN-1 HERE")
      WRITE(6,7) SLSDBTR,PVTRGD,FLSR
7     FORMAT(" SLSDBTR,PVTRGD,FLSR ",3F10.0)
      IF(IBTE.LE.2) GO TO 401
6     CONTINUE
      WRITE(6,28)
28    FORMAT(" MAIN- 2 HERE")
```

```
      DO 402   IB=1,10
      BTE=10.*FLOAT(IB)
      CALL BASIN(GBM,BTE,EFK)
      IF(EFK.GT.500)   EFK=500
      AKEF(IB)=EFK
 402  CONTINUE
      IF(IRIGDNA.NE.6) GO TO 401
      DO 4 I=1,10
      T =10.*FLOAT(I)
      WRITE(6,30)
 30   FORMAT(" MAIN- 4 HERE")
*    START REDUCED SUBGRADE RIGID
      IF (IFGRP .EQ. 1)   GO TO 1520
      IF (IFGRP .EQ. 2)   GO TO 1510
      RK=(125.*T+50.)/22.
      GO TO 1530
1510  RK=(166.*T+50.)/21.
      GO TO 1530
 1520 RK=(175.*T+20.)/16.
1530  CONTINUE
      WRITE(6,29)
 29   FORMAT(" MAIN- 3 HERE")
4     AKEFT(I)=RK
      DO 5  I=1,10
      IF(AKEFT(I).LT.AKEF(I))  GO TO 5
      AKEFT(I)=AKEF(I)
   5  CONTINUE
       WRITE(6,8) AKEF,AKEFT
 8    FORMAT(" MAIN-K,RKS=",10F10.2)
 401  CONTINUE
      LR=1
 1    CONTINUE
      IF(NRIGID.EQ.0) GO TO 116
      IF(LZ.EQ.3) GO TO 9
      IF(NRIGID.EQ.1) CALL SECOND(B)
      IF(NRIGID.EQ.1) WRITE(6,2500) B
      IF(NRIGID.EQ.1)CALL REMARK(15HENTER OVERLAY 2)
      IF(NRIGID.EQ.1) CALL OVERLAY(4HLIFE,2,0,6HRECALL)
      IF(NRIGID.EQ.1)CALL REMARK(14HEXIT OVERLAY 2)
      IF(LR.EQ.1)WRITE(8,9800)(JTYPE(LO,JJ),LO=1,3),HH(1),HH(10),XK,(STO
     1RE1(JJ,I),I=1,NOH)
      IF(LR.EQ.2)WRITE(8,9900)(JTYPE(LO,JJ),LO=1,3),HH(1),HH(10),XK,(STO
     1RE2(JJ,I),I=1,NOH)
      DO 3 I=1,NOH
      IF((LT.EQ.2).A.(LR.EQ.1)) STORE1(JJ,I)=STORE1(JJ,I)*1.2
      IF((LT.EQ.2).A.(LR.EQ.2)) STORE2(JJ,I)=STORE2(JJ,I)*1.2
 3    CONTINUE
      GO TO 10
9       CONTINUE
      CALL COVSK(XK,XSTR,XH)
      IF(LR.EQ.1) HH(1) = XH
      IF(LR.EQ.2) AHH(1)=XH
 10   IF(LR.EQ.2) GO TO 16
      LR=2
      YK=XK
      IF(IAXK.NE.1) GO TO 16
      XK=AXK
      GO TO 1
16    CONTINUE
      XK=YK
  116 CONTINUE
      DO 35 I=1,LS
      IF(NRIGID.EQ.0) GO TO 32
      COVRGD(JJ,I)=TRY(I)/FAC
      COVRGD(JJ,I)=COVRGD(JJ,I)+TRL(JJ)/FAC
   32 IF(LZ.NE.3) GO TO 35
      IF(NFLEX.EQ.0) GO TO 35
      COVRGD(2,I)=TRYF(I)/FAC
      COVRGD(2,I)=COVRGD(2,I)+TRL(JJ)/FAC
   35 CONTINUE
      IF(NFLEX.LE.0) GO TO 40
      REWIND 5
      READ(5,9100)(ESWL(JJ,I),I=1,20)
      READ(5,4000)AESWL(JJ),WHEELS(JJ)
      WRITE(6,7000)(ESWL(JJ,I),I=1,20)
      WRITE(6,7000)AESWL(JJ),WHEELS(JJ)
      DO 66 I=1,20
      ESWL(JJ,I)=ESWL(JJ,I)/AESWL(JJ)
   66 CONTINUE
      WRITE(6,7000)(ESWL(JJ,I),I=1,20)
40    CONTINUE
      IF(NFLEX.LE.0)GO TO 20
      ICBR=1+NNAT+NCOM+NSBB+NB
      CBR(1)=XCBR
      II=1
      IF(NNAT.EQ.0)GO TO 206
      DO 201 I=1,NNAT
      II=1+I
      CBR(II)=YCBR(I,1)
  201 CONTINUE
  206 CONTINUE
      IF(NCOM.EQ.0)GO TO 207
      IX=II
      DO 202 I=1,NCOM
      II=IX+I
      CBR(II)=ZCBR(I,1)
  202 CONTINUE
  207 CONTINUE
      IF(NSBB.EQ.0)GO TO 208
      IX=II
      DO 203 I=1,NSBB
      II=IX+I
      CBR(II)=XMT(I,1)
  203 CONTINUE
  208 CONTINUE
      IF(NB.EQ.0)GO TO 209
      IX=II
      DO 204 I=1,NB
      II=IX+I
      CBR(II)=ZMT(I,1)
  204 CONTINUE
  209 CONTINUE
      WRITE(6,1000)ICBR
      WRITE(6,2000)CBR
      CALL SORT(CBR,ICBR)
      WRITE(6,1000)ICBR
      WRITE(6,2000)CBR
   20 CONTINUE
      IF(NRIGID.EQ.0)GO TO 141
      IF(LZ.EQ.3) GO TO 141
      DO 145 I=1,NOH
      AHH(I)=HH(I)
  145 CONTINUE
      FK3=1.-.046*(XK-200.)/100.
      FK1=.954-.06*(XK-300.)/100.
      FK2=.894-.086*(XK-400.)/100.
      IG=1
      IF(IAXK.EQ.1) IG=2
      DO 142 IE=1,IG
      IF(IE.EQ.2) GO TO 143
      DO 140 I=1,NOH
      IF(XK.GE.200..A.XK.LT.300.)HH(I)=HH(I)*FK3
      IF(XK.GE.300..A.XK.LT.400.) HH(I)=HH(I)*FK1
      IF(XK.GE.400..A.XK.LT.500.) HH(I)=HH(I)*FK2
      IF(XK.GE.500.) HH(I)=HH(I)*.808
  140 CONTINUE
      GO TO 142
  143 DO 144 I=1,NOH
      IF(XK.GE.200..A.XK.LT.300.)AHH(I)=AHH(I)*FK3
      IF(XK.GE.300..A.XK.LT.400.) AHH(I)=AHH(I)*FK1
      IF(XK.GE.400..A.XK.LT.500.) AHH(I)=AHH(I)*FK2
      IF(XK.GE.500.) AHH(I)=AHH(I)*.808
  144 CONTINUE
  142 CONTINUE
  141 CONTINUE
      IF(NP.EQ. 1) WRITE(6,8001)
      IF(NP .EQ. 2) WRITE(6,8002)
      IF(NP .LT. 1 .OR. NP .GT. 2) WRITE(6,8006)
      IF(ID .EQ. 1) WRITE(6,8007)
      IF(ID .EQ. 2) WRITE(6,8008)
      IF(ID.EQ.3) WRITE(6,8020)
      IF(ID .LT. 1 .OR. ID .GT. 3) WRITE(6,8009)
      WRITE(6,8005) JDL,IMIX
      CALL SECOND(B)
      WRITE(6,2500) B
      CALL REMARK(15HENTER OVERLAY 3)
      CALL OVERLAY (4HLIFE,3,0,0)
      CALL REMARK(14HEXIT OVERLAY 3)
      CALL SECOND(B)
      WRITE(6,2500) B
      CALL REMARK(15HENTER OVERLAY 6)
      CALL OVERLAY(4HLIFE,6,0,0)
      CALL REMARK(14HEXIT OVERLAY 6)
      STOP 0011
      END
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              PROGRAM MAIN        74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE     8

     CARD NR. SEVERITY  DETAILS     DIAGNOSIS OF PROBLEM

        185     I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.



          SYMBOLIC REFERENCE MAP (R=3)

     ENTRY POINTS      DEF LINE      REFERENCES
     15743  MAIN              2          60        74        82

     VARIABLES        SN  TYPE              RELOCATION
          0  A             REAL                  ABLK        REFS        19
        310  AESWL         REAL       ARRAY      WES         REFS       304       306   DEFINED       302
         51  AG            REAL       ARRAY      ABLK        REFS        19
         13  AH            REAL       ARRAY      ABLK        REFS        19
         36  AHH           REAL       ARRAY      HBLK        REFS        43       367       368       369       370
                                                          DEFINED       280       350       367       368       369       370
         25  AK            REAL       ARRAY      ABLK        REFS        19
          0  AKEF          REAL       ARRAY      AKBLK       REFS        21       253       254       256   DEFINED       233
          0  AKEFT         REAL       ARRAY      ABLK3       REFS        20       253       256   DEFINED       251       254
         15  AKY           REAL                  AKBLK       REFS        21
          0  ALOS          REAL                  SA          REFS        71
         10  AMINOR        REAL                  KARD        REFS        45
          1  AP            REAL       ARRAY      ABLK        REFS        19
         55  APREND        REAL       ARRAY      ZONES       REFS        83
         22  APRSTR        REAL       ARRAY      ZONES       REFS        83
        111  APTOT         REAL                  ZONES       REFS        83   DEFINED        97
         11  APWID         REAL       ARRAY      ZONES       REFS        83
          0  AREA          REAL                  ARBK        REFS        23   DEFINED       105
         37  ASIG          REAL       ARRAY      ABLK        REFS        19
          0  AXK           REAL                  LCY         REFS        49       219       220       285   DEFINED       218       219
                                                              220
      20374  B             REAL                              REFS       161       162       263       264       382       383       387
                                                              388
         13  BIG           REAL                  AKBLK       REFS        21
         16  BMOIST        REAL                  KARD        REFS        45
          2  BTE           REAL                  BSBLK       REFS        30       231   DEFINED       102       230
          7  CAVCSTO       REAL                  DRNBLK2     REFS        39
        334  CBR           REAL       ARRAY      WES         REFS        82       342       343       345   DEFINED       312       317
                                                              324       331       338
         21  CBR10         REAL                  KARD        REFS        45
         20  CBR8          REAL                  KARD        REFS        45
          0  CCCST         REAL       ARRAY      CSTBK       REFS        33   DEFINED        87
        717  CHAR          REAL       ARRAY      RL2         REFS        68   DEFINED        87        89
         36  CLNDRN        REAL                  PRVNT       REFS        60
         40  CLNSWP        REAL                  PRVNT       REFS        60
          0  COMPF         REAL                  BLOCKB      REFS        25
          1  COMPR         REAL                  BLOCKB      REFS        25
         22  COMS          REAL       ARRAY      KARD        REFS        45
         42  COSTF         REAL                  PRVNT       REFS        60
          5  COSTR         REAL                  PRVNT       REFS        60
        312  COVM          REAL       ARRAY      SGSWP2
        310  COVRGD        REAL       ARRAY      MIXBLK      REFS        54       293       297   DEFINED       292       293       296
                                                              297
          PROGRAM MAIN        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00         PAGE     9

VARIABLES     SN  TYPE              RELOCATION
   34  CRSL      REAL              PRVNT         REFS        60
   14  CSTRT     REAL      ARRAY   RDSTR         REFS        64   DEFINED        98
    3  CUTPRCE   REAL              TSV           REFS        79
  336  DCOM      REAL      ARRAY   SGSWP2        REFS        74
    0  DESIGN    REAL              KARD          REFS        45
    3  DFI       REAL              KARD          REFS        45
    0  DLCF      REAL              CUSR          REFS        34   DEFINED        96
    1  DLCR      REAL              CUSR          REFS        34   DEFINED        96
    3  DLO       REAL              DRNBLK2       REFS        39
    1  DRAIN     REAL              DRNBLK        REFS        38   DEFINED       109
    0  DRNCST    REAL              DRNBLK        REFS        38   DEFINED       109
   17  DRYWT     REAL              KARD          REFS        45
    2  DSC       REAL              COND          REFS        32   DEFINED        85
  471  DSCRPT    REAL      ARRAY   RL2           REFS        68   DEFINED        87
    3  DT        REAL              DOBK          REFS        36   DEFINED       102
    2  DT2Q      REAL              DOBK          REFS        36
    2  EARTHWK   REAL              RL1           REFS        67     2*171   DEFINED        97
20404  EFK       REAL                            REFS       231       232       233   DEFINED       232
    2  EPO       REAL              DRNBLK2       REFS        39
    1  ERCOST    REAL              TSV           REFS        79
    1  ESC       REAL              COND          REFS        32   DEFINED        85
    0  FSWL      REAL      ARRAY   WES           REFS        82       303       306       308   DEFINED       301       306
   26  FAC       REAL              LCY           REFS        49       292       293       296       297
                                              DEFINED       187       188
    0  FACC      REAL              IABLK         REFS        44       188
    1  FACN      REAL              IABLK         REFS        44       187
    6  FACTOR    REAL              RL1           REFS        67   DEFINED       105
    1  FACTR1    REAL              PRVNT         REFS        60
    2  FACTR2    REAL              PRVNT         REFS        60
    3  FACTR3    REAL              PRVNT         REFS        60
    2  FCOMPF    REAL              BLOCKB        REFS        25
    3  FCOMPR    REAL              BLOCKB        REFS        25
    1  FDE       REAL              BSBLK         REFS        30   DEFINED       160
    0  FDEF      REAL              BSBLK2        REFS        31
   10  FILCSTO   REAL              DRNBLK2       REFS        39
    4  FILPRCE   REAL              TSV           REFS        79
20414  FK1       REAL                            REFS       361       368   DEFINED       353
20415  FK2       REAL                            REFS       362       369   DEFINED       354
20413  FK3       REAL                            REFS       360       367   DEFINED       352
    6  FLEXPT    REAL              KARD          REFS        45
   10  FLSF      REAL              BLOCKB        REFS        25
   11  FLSR      REAL              BLOCKH        REFS        25       223
    4  FRSTSL    REAL              PRVNT
   14  FRSUBF    REAL              BLOCKB        REFS        25
   15  FRSUBR    REAL              BLOCKB        REFS        25
    3  GAM       INTEGER           BSBLK         REFS        16        30       231   DEFINED       100
    0  HH        REAL      ARRAY   HBLK          REFS        43     2*268     2*270       350       360       361       362
                                                  363   DEFINED     2*102       279       360       361       362       363
    5  H30       REAL              DRNBLK2       REFS        39
20375  I         INTEGER                         REFS     2*189       199       205       207       211       216       237
                                                  251     2*253     2*254       268       270     2*273     2*274     2*292
                                                2*293     2*296     2*297       301       303     2*306       308       316
                                                  317       323       324       330       331       337       338     2*350
                                                2*360     2*361     2*362     2*363     2*367     2*368     2*369     2*370
                                              DEFINED     2*189       198       236       252       268       270       272
                                                  290       301       303       305       308       315       322       329
                                                  336       349       359       366
          PROGRAM MAIN       74/74    OPT=0 ROUND=*/ TRACE         FTN 4.6+420         09/02/77  13.54.00       PAGE    10

VARIABLES    SN  TYPE           RELOCATION
    3  IA        INTEGER             IABLK        REFS        44       191       192       195
   12  IAA       INTEGER    ARRAY    LTTBLK       REFS        50   DEFINED       195
    0  IAXK      INTEGER             KAYBK        REFS        48       218       219       220       284       356
                                                DEFINED      95
20403  IB        INTEGER                          REFS       230       233   DEFINED       229
    1  IBN       INTEGER             AMBLK        REFS        22       192   DEFINED        95
    0  IBTE      INTEGER             BSBLK        REFS        30     2*166       225   DEFINED        95
    1  ICRR      INTEGER             MXBLK        REFS        56       341       343       344   DEFINED       311
    0  ICOND     INTEGER             COND         REFS        32   DEFINED        85
    1  ICONFIG   INTEGER             KARD         REFS        45
    2  ICOUNT    INTEGER             RESTR        REFS        65
    0  ICYCLE    INTEGER             PRVNT        REFS        60
    0  ID        INTEGER             DORK         REFS        36       377       378       379     2*380
                                                DEFINED     100
    3  IDENT     INTEGER    ARRAY    RL1          REFS        67   DEFINED       107
    2  IDF       INTEGER             RODLOD       REFS        70   DEFINED       103
    0  IDGWTO    INTEGER             DRNBLK2      REFS        39
    1  IDIPO     INTEGER             DRNBLK2      REFS        39
    0  IDR       INTEGER             RODLOD       REFS        70   DEFINED       103
    2  IDRY      INTEGER             SUBK         REFS        75   DEFINED        96
   15  IDSCRPT   INTEGER    ARRAY    RL2          REFS        68   DEFINED       107
20417  IE        INTEGER                          REFS       358   DEFINED       357
    0  IFCON     INTEGER             FCON         REFS        41   DEFINED        95
   11  IFGRP     INTEGER             KARD         REFS        45       175       176       177       241       242
   70  IFL       INTEGER             PRVNT        REFS        60
    2  IFLEXNA   INTEGER             BLOCKD       REFS        29       178     2*179     2*180
   12  IFSWIT    INTEGER    ARRAY    ABLK3        REFS        20
20416  IG        INTEGER                          REFS       357   DEFINED       355       356
    0  IGINT     INTEGER             MXBLK        REFS        56   DEFINED       184
20411  II        INTEGER                          REFS       317       321       324       328       331       335       338
                                                DEFINED     313       316       323       330       337
    1  IIPAVT    INTEGER             BLOCKC       REFS        28
    0  IMAN      INTEGER             RDSTR        REFS        64   DEFINED       105
  620  IMIX      INTEGER             MIXBLK       REFS        54       185       192       381   DEFINED        86
    0  IND       INTEGER             TMPL         REFS        78
    5  IPAVT     INTEGER             KARD         REFS        45
    0  IREST     INTEGER             RESTR        REFS        65   DEFINED        96
   33  IRG       INTEGER             PRVNT        REFS        60
    3  IRIGDNA   INTEGER             BLOCKD       REFS        29       181     2*182       183       235
    0  IRL       INTEGER             BLBLK        REFS        24   DEFINED        95
    0  ISKIP     INTEGER             PRVNT1       REFS        63   DEFINED        94
   14  ISUBCBR   INTEGER             KARD         REFS        45
   15  ISUBHOR   INTEGER             KARD         REFS        45
   15  ISWITF    INTEGER             BLOCKC       REFS        28
   16  ISWITR    INTEGER             BLOCKC       REFS        28
    1  ITY       INTEGER             DORK         REFS        36   DEFINED       100
    1  IURC      INTEGER             SUBK         REFS        75   DEFINED       100
    2  IVM       INTEGER             PRVNT1       REFS        63   DEFINED        94
20412  IK        INTEGER                          REFS       323       330       337   DEFINED       321       328       335
20402  J         INTEGER                          REFS       210       215   DEFINED       209       214
    3  JACK      INTEGER             TMPL         REFS        78
    0  JCOND     INTEGER             FLAG         REFS        42
   37  JCYCLE    INTEGER             PRVNT        REFS        60
    0  JDL       INTEGER             SCAN3        REFS        73       189       192       381   DEFINED       100
    1  JISKIP    INTEGER             PRVNT1       REFS        63   DEFINED        94
  622  JJ        INTEGER             MIXBLK       REFS        54       186     3*189       194       195       210     2*268
                                                 2*270     2*273     2*274       292     3*293       297       301     2*302
          PROGRAM MAIN        74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00       PAGE    11
VARIABLES      SN  TYPE           RELOCATION
                                                       303    2*304      3*306       308   DEFINED       185
     0 JMAN       INTEGER             MANLK           REFS       53    DEFINED       105
     1 JREST      INTEGER             RESTR           REFS       65    DEFINED       105
     0 JTYPE      INTEGER    ARRAY    RLMN            REFS       66        186       189       268       270
                                                   DEFINED       99
    26 JXX        INTEGER    ARRAY    MANLK           REFS       53    DEFINED       101
     1 K4         INTEGER             RL1             REFS       67
     0 K7         INTEGER             RL1             REFS       67    DEFINED        86
    26 LCIND      INTEGER             KARD            REFS       45
     6 LENGTHO    INTEGER             DRNBLK2         REFS       39
     1 LFUNC      INTEGER             TYPBK           REFS       81    DEFINED       100
 20401 LLL        INTEGER                             REFS      209        214   DEFINED       207
     0 LMH        INTEGER             TYPBK           REFS       81    DEFINED       100
 20407 LO         INTEGER                             REFS      268        270   DEFINED       268       270
     5 LOCATE     INTEGER    ARRAY    RL2             REFS       68    DEFINED       107
    15 LOUTO      INTEGER             DRNBLK2         REFS       39
   621 LR         INTEGER             MIXBLK          REFS       54        218       219       268       270        273       274
                                                       279      280        281   DEFINED       156       259        282
    27 LS         INTEGER             LCY             REFS       49        198       290   DEFINED       109
     2 LT         INTEGER             IABLK           REFS       44        191       194       273       274
     0 LTT        INTEGER    ARRAY    LTTBLK          REFS       50    DEFINED       194
     1 L7         INTEGER             RODLOD          REFS       70        212       262       294       348
     2 MESS       INTEGER    ARRAY    BLOCKC          REFS       28
     1 MLYST      INTEGER             MANLK           REFS       53    DEFINED       100
 20400 MMM        INTEGER                             REFS      209        214   DEFINED       202       205
     0 MNT        INTEGER             DOM             REFS       37    DEFINED       105
     1 MNTO       INTEGER             SZBK            REFS       76    DEFINED        97
     0 MSGSW1     INTEGER             BLOCKC          REFS       28
    17 MSGSW2     INTEGER             BLOCKC          REFS       28
    20 MSGSW3     INTEGER             BLOCKC          REFS       28
     0 MXN        INTEGER             AMBLK           REFS       22        192   DEFINED        95
     0 MXTO       INTEGER             SZBK            REFS       76    DEFINED        96
     0 NAME       INTEGER    ARRAY    RL2             REFS       68    DEFINED       107
   110 NAPR       INTEGER             ZONES           REFS       83
   243 NB         INTEGER             LYTD            REFS       51        311       334       336   DEFINED         86
    51 NCOM       INTEGER             LYTD            REFS       51        311       320       322   DEFINED         86
     5 NERTH      INTEGER             TSV             REFS       79
    43 NFL        INTEGER             PRVNT           REFS       60
     1 NFLEX      INTEGER             TYP             REFS       80        213       295       299       310
                                                   DEFINED      105
     0 NLYST      INTEGER             NANLK           REFS       57
     0 NNAT       INTEGER             LYTD            REFS       51        311       314       315   DEFINED         86
    36 NOACFT     INTEGER    ARRAY    RLMN            REFS       66        189       210       215   DEFINED        105
     5 NOD        INTEGER             NBLK            REFS       58
     0 NOG        INTEGER             NBLK            REFS       58
   310 NOGWT      INTEGER             SGSWP2          REFS       74
     1 NOH        INTEGER             NBLK            REFS       58        192       268       270       272        349       359
                                                       366
     2 NOO        INTEGER    ARRAY    RDSTR           REFS       64    DEFINED        98
     6 NOSG       INTEGER             NBLK            REFS       58
    14 NOUTO      INTEGER             DRNBLK2         REFS       39
     1 NP         INTEGER             SCAN3           REFS       73        188       374       375     2*376
                                                   DEFINED      105
     2 NPT        INTEGER             NBLK            REFS       58
   311 NREX2      INTEGER             SGSWP2          REFS       74
     6 NRG        INTEGER             PRVNT           REFS       60
     0 NRIGID     INTEGER             TYP             REFS       80        208       261       263       264        265       266
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         PROGRAM MAIN        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    12

VARIABLES       SN  TYPE            RELOCATION
                                                      267        291         347   DEFINED       100
    146  NSBB       INTEGER               LYTD        REFS         51         311       327       329   DEFINED        86
      1  NUMS       INTEGER               RDSTR       REFS         64
      3  NX         INTEGER               NBLK        REFS         58
      4  NY         INTEGER               NBLK        REFS         58
      2  NYOO       INTEGER     ARRAY     MANLK       REFS         53   DEFINED       101
      0  OMTF       REAL                  MTO         REFS         55   DEFINED       107
      1  OMTR       REAL                  MTO         REFS         55   DEFINED       107
     27  CVR        REAL                  KARD        REFS         45
     12  PAVT       REAL                  AKBLK       REFS         21
      4  PERMO      REAL                  DRNBLK2     REFS         39
     11  PIPCSTO    REAL                  DRNBLK2     REFS         39
     16  PRDBTF     REAL                  BLOCKB      REFS         25
     20  PRDBTR     REAL                  BLOCKB      REFS         25
     17  PRFLTF     REAL                  BLOCKB      REFS         25
     21  PRFLTR     REAL                  BLOCKB      REFS         25
      2  PSTEP      REAL                  TSV         REFS         79
     35  PTCH       REAL                  PRVNT       REFS         60
      0  PVTFLX     REAL                  BLOCKD      REFS         29
      1  PVTRGD     REAL                  BLOCKD      REFS         29         223
     44  REPFL      REAL        ARRAY     PRVNT       REFS         18          60
      7  REPRG      REAL        ARRAY     PRVNT       REFS         18          60
      7  RIGDPT     REAL                  KARD        REFS         45
  20406  RK         REAL                              REFS        251   DEFINED       243       245       247
     13  RNO        REAL                  DRNBLK2     REFS         39
  20420  ROAD       REAL       *UNDEF                 REFS         17
     12  RSUBF      REAL                  BLOCKB      REFS         25
     13  RSUBR      REAL                  BLOCKB      REFS         25
     12  S          REAL                  SBLK        REFS         72
     71  SCLPOP     REAL                  PRVNT       REFS         60
      0  SIGMA      REAL        ARRAY     SBLK        REFS         72
     41  SLCT       REAL                  PRVNT       REFS         60
     12  SLO        REAL                  DRNBLK2     REFS         39
      4  SLSDBIF    REAL                  BLOCKB      REFS         25
      5  SLSDBTR    REAL                  BLOCKB      REFS         25         223
      6  SLSPENF    REAL                  BLOCKB      REFS         25
      7  SLSPENR    REAL                  BLOCKB      REFS         25
     12  SMOIST     REAL                  KARD        REFS         45
     13  SR         REAL                  SBLK        REFS         72
      0  STORE1     REAL        ARRAY     MIXBLK      REFS         54         268       273   DEFINED       103       273
    144  STORE2     REAL        ARRAY     MIXBLK      REFS         54         270       274   DEFINED       103       274
      0  SUBD       REAL                  SUBK        REFS         75         193   DEFINED       102
     13  SUBMOD     REAL                  KARD        REFS         45
      1  SWID       REAL                  TMPL        REFS         78
  20405  T          REAL                              REFS        243         245       247   DEFINED       237
     14  TBS        REAL                  AKBLK       REFS         21
     14  TCY        REAL        ARRAY     SCAN3       REFS         73
      4  TDFP       REAL                  KARD        REFS         45
      0  THCK       REAL                  TSV         REFS         79
      0  THFF       REAL        ARRAY     THKBK       REFS         77
     12  TM         REAL        ARRAY     HBLK        REFS         43         205       207   DEFINED     2*109
  20376  TR         REAL                              REFS        210         211   DEFINED       196       210
      2  TRAFF      REAL                  KARD        REFS         45
  20377  TRF        REAL                              REFS        215         216   DEFINED       197       215
     24  TRKK       REAL        ARRAY     THKBK       REFS         77
      2  TRL        REAL        ARRAY     SCAN3       REFS         73         189       293       297   DEFINED        97
      0  TRPQZ      REAL        ARRAY     PQZ         REFS         59
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            PROGRAM MAIN       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE     13

VARIABLES     SN  TYPE              RELOCATION
    0  TRST       REAL              DMBLK           REFS        35   DEFINED       105
    2  TRY        REAL    ARRAY     LCY             REFS        49       292   DEFINED       211
20432  TRYF       REAL    ARRAY                     REFS        17       296   DEFINED       216
    2  TWOCL      REAL              TMPL            REFS        78
  322  WHEELS     REAL    ARRAY     WES             REFS        82       304   DEFINED       302
    1  WOS        REAL              SA              REFS        71
   30  XCBR       REAL              LCY             REFS        49       190       193       312   DEFINED       102
    0  XFP        REAL    ARRAY     SG5WP2          REFS        74
20410  XH         REAL                              REFS       278       279       280
    7  XK         REAL              NBLK            REFS        58       190       218       219       268       270       278
                                                     283       352       353       354     2*360     2*361     2*362       363
                                                   2*367     2*368     2*369       370   DEFINED       102       285       288
  147  XMT        REAL    ARRAY     LYTD            REFS        51       331
   31  XSTR       REAL              LCY             REFS        49       190       278   DEFINED       102
   22  XTRA       REAL              BLOCKB          REFS        25
    1  YCBR       REAL    ARRAY     LYTD            REFS        51       317
    1  YK         REAL              LCY             REFS        49       288   DEFINED       283
   52  ZCHR       REAL    ARRAY     LYTD            REFS        51       324
  244  ZMT        REAL    ARRAY     LYTD            REFS        51       338
    0  ZONSTEP    REAL    ARRAY     ZONES           REFS        83

FILE NAMES        MODE
13601  ADATA
 6322  INPUT
 5257  OUTPUT
    0  OUT1
 1043  OUT2
 2106  OUT3
 3151  OUT4
 4214  OUT5
14644  OUT6
 7365  SF2
10430  SF3
11473  SF5
12536  SF7
 6322  TAPE1
13601  TAPE10
 4214  TAPE11
14644  TAPE12
 7365  TAPE2
10430  TAPE3
 3151  TAPE4
11473  TAPE5      FMT                        READS       301       302    MOTION       300
 1043  TAPE6      FMT                       WRITES       159       162       175       176       177       178       179       180
                                               181       182       183       189       190       191       192       193       221
                                               223       227       238       249       256       264       303       304       308
                                               341       342       344       345       374       375       376       377       378
                                               379       380       381       383       388
12536  TAPE7
    0  TAPE8      FMT                       WRITES       157       158       268       270
 2106  TAPE9

EXTERNALS         TYPE    ARGS      REFERENCES
       BASIN                3              231
       COPY                 1              186
       COVSK                3              278
       OVERLAY              4              164       168       173       266       385       390
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          PROGRAM MAIN       74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     14

EXTERNALS            TYPE    ARGS         REFERENCES
       REMARK                  1            163        165        167        169        172        174        265        267        384
                                            386        389        391
       SECOND                  1            161        263        382        387
       SORT                    2            343

INLINE FUNCTIONS     TYPE    ARGS           DEF LINE   REFERENCES
       FLOAT       REAL        1  INTRIN               230        237

STATEMENT LABELS               DEF LINE    REFERENCES
16404   1                        260         286
16211   2                        212         208
    0   3                        275         272
    0   4                        251         236
16373   5                        255         252        253
    0   6            INACTIVE    226
20111   7       FMT              224         223
20145   8       FMT              257         256
16537   9                        277         262
16552  10                        281         276
16231  11                        217         198        212        213
16155  12                        201         199
16161  13                        204         200
16166  14                        206         203
    0  15                        210         209
16567  16                        287         281        284
17430  17       FMT              110         175
17435  18       FMT              111         176
17442  19       FMT              112         177
17070  20                        346         310
17447  21       FMT              113         178
17456  22       FMT              114         179
17465  23       FMT              115         180
17475  24       FMT              116         181
17504  25       FMT              117         182
17513  26       FMT              118         183
20100  27       FMT              222         221
20121  28       FMT              228         227
20135  29       FMT              250         249
20127  30       FMT              239         238
    0  31                        215         214
16612  32                        294         291
16631  35                        298         290        294        295
16741  40                        309         185        299
    0  66                        307         305
16572 116                        289         261
    0 140                        364         359
17235 141                        373         347        348
17231 142                        372         357        365
17175 143                        366         358
    0 144                        371         366
    0 145                        351         349
    0 201                        318         315
    0 202                        325         322
    0 203                        332         329
    0 204                        339         336
16775 206                        319         314
17015 207                        326         320
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          PROGRAM MAIN        74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE    15

STATEMENT LABELS                 DEF LINE   REFERENCES
17035  208                          333        327
17055  209                          340        334
16401  401                          258        225         235
    0  402                          234        229
16004  473                          170        166
16017  474                          175        171
17522  1000     FMT                 119        341         344
17524  1500     FMT  NO REFS        120
16341  1510                         245        242
16347  1520                         247        241
16354  1530                         248        244         246
17526  2000     FMT                 121        193         342        345
17530  2500     FMT                 122        162         264        383        388
17536  3000     FMT  NO REFS        123
17540  4000     FMT                 124        302
17542  5000     FMT                 125        191
17544  6000     FMT                 126        192
17547  7000     FMT                 127        303         304        308
17552  8001     FMT                 128        374
17556  8002     FMT                 129        375
17562  8003     FMT                 130        189
17574  8004     FMT                 132        190
17576  8005     FMT                 133        381
17600  8006     FMT                 134        376
17604  8007     FMT                 135        377
17611  8008     FMT                 136        378
17616  8009     FMT                 137        380
17625  8020     FMT                 138        379
17631  9000     FMT                 139        159
17636  9001     FMT                 140        157
17640  9002     FMT                 141        158
17663  9100     FMT                 144        301
17665  9800     FMT                 145        268
17723  9900     FMT                 150        270

LOOPS  LABEL     INDEX      FROM-TO     LENGTH    PROPERTIES
16075  40      * JJ         185 309      647B                EXT REFS  NOT INNER
16150  11      * I          198 217       64B                NOT INNER
16176  15        J          209 210        7B      INSTACK
16217  31        J          214 215        6B      INSTACK
16274  402     * IB         229 234       17B                EXT REFS
16320  4       * I          236 251       42B                EXT REFS
16364  5         I          252 255       12B        OPT
16447          * I          268 268       11B                EXT REFS
16473          * I          270 270       11B                EXT REFS
16510  3         I          272 275       25B        OPT
16574  35        I          290 298       40B        OPT
16643          * I          301 301       11B                EXT REFS
16667          * I          303 303       11B                EXT REFS
16712  66        I          305 307       10B        OPT
16725          * I          308 308       11B                EXT REFS
16763  201       I          315 318       11B        OPT
17003  202       I          322 325       11B        OPT
17023  203       I          329 332       11B        OPT
17043  204       I          336 339       11B        OPT
17077  145       I          349 351        6B      INSTACK
17134  142     * IE         357 372      100B                NOT INNER
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           PROGRAM MAIN        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    16

      LOOPS  LABEL      INDEX       FROM-TO      LENGTH      PROPERTIES
      17141  140        I           359 364        328           OPT
      17176  144        I           366 371        328           OPT

      COMMON BLOCKS     LENGTH      MEMBERS - BIAS NAME(LENGTH)
             ABLK           51                   0 A        (1)            1 AP      (10)              11 AH      (10)
                                                21 AK       (10)          31 ASIG    (10)              41 AG      (10)
             ABLK3          20                   0 AKEFT    (10)          10 IFSWIT  (10)
             AKBLK          14                   0 AKEF     (10)          10 PAVT    (1)               11 BIG     (1)
                                                12 TBS      (1)           13 AKY     (1)
             AMBLK           2                   0 MXN      (1)            1 IBN     (1)
             ARBK            1                   0 AREA     (1)
             BLBLK           1                   0 IRL      (1)
             BLOCKB         19                   0 COMPF    (1)            1 COMPR   (1)                2 FCOMPF  (1)
                                                 3 FCOMPR   (1)            4 SLSDBIF (1)                5 SLSDBTR (1)
                                                 6 SLSPENF  (1)            7 SLSPENR (1)                8 FLSF    (1)
                                                 9 FLSR     (1)           10 RSUBF   (1)               11 RSUBR   (1)
                                                12 FRSUBF   (1)           13 FRSUBR  (1)               14 PRDBTF  (1)
                                                15 PRFLTF   (1)           16 PRDBTR  (1)               17 PRFLTR  (1)
                                                18 XTRA     (1)
             BLOCKC         17                   0 MSGSW1   (1)            1 IIPAVT  (1)                2 MESS    (11)
                                                13 ISWITF   (1)           14 ISWITR  (1)               15 MSGSW2  (1)
                                                16 MSGSW3   (1)
             BLOCKD          4                   0 PVTFLX   (1)            1 PVTRGD  (1)                2 IFLEXNA (1)
                                                 3 IRIGDNA  (1)
             BSBLK           4                   0 IBTE     (1)            1 FDE     (1)                2 BTE     (1)
                                                 3 GBM      (1)
             BSBLK2          1                   0 FDEF     (1)
             COND            3                   0 ICOND    (1)            1 ESC     (1)                2 DSC     (1)
             CSTBK        1000                   0 CCCST    (1000)
             CUSR            2                   0 DLCF     (1)            1 DLCR    (1)
             DMBLK           1                   0 TRST     (1)
             DOBK            4                   0 ID       (1)            1 ITY     (1)                2 DT2Q    (1)
                                                 3 DT       (1)
             DOM             1                   0 MNT      (1)
             DRNBLK          2                   0 DRNCST   (1)            1 DRAIN   (1)
             DRNBLK2        14                   0 IDGWTO   (1)            1 IDIPO   (1)                2 EPO     (1)
                                                 3 DLO      (1)            4 PERMO   (1)                5 H30     (1)
                                                 6 LENGTHO  (1)            7 CAVCSTO (1)                8 FILCSTO (1)
                                                 9 PIPCSTO  (1)           10 SLO     (1)               11 RNO     (1)
                                                12 NOUTO    (1)           13 LOUTO   (1)
             FCON            1                   0 IFCON    (1)
             FLAG            1                   0 JCOND    (1)
             HBLK           40                   0 HH       (10)          10 TM      (20)              30 AHH     (10)
             IABLK           4                   0 FACC     (1)            1 FACN    (1)                2 LT      (1)
                                                 3 IA       (1)
             KARD           24                   0 DESIGN   (1)            1 ICONFIG (1)                2 TRAFF   (1)
                                                 3 DFI      (1)            4 TDFP    (1)                5 IPAVT   (1)
                                                 6 FLEXPT   (1)            7 RIGDPT  (1)                8 AMINOR  (1)
                                                 9 IFGRP    (1)           10 SMOIST  (1)               11 SUBMOD  (1)
                                                12 ISUBCBR  (1)           13 ISUBHOR (1)               14 BMOIST  (1)
                                                15 DRYWT    (1)           16 CBR8    (1)               17 CBR10   (1)
                                                18 COMS     (4)           22 LCIND   (1)               23 OVR     (1)
             KAYBK           1                   0 IAXK     (1)
             LCY            26                   0 AXK      (1)            1 YK      (1)                2 TRY     (20)
                                                22 FAC      (1)           23 LS      (1)               24 XCBR    (1)
                                                25 XSTR     (1)
             LTTBLK         20                   0 LTT      (10)          10 IAA     (10)
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       PROGRAM MAIN        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00          PAGE     17

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
        LYTD        176            0 NNAT   (1)             1 YCBR   (40)           41 NCOM   (1)
                                  42 ZCBR   (60)          102 NSBB   (1)           103 XMT    (60)
                                 163 NB     (1)           164 ZMT    (12)
        MANLK       422            0 JMAN   (1)             1 MLYST  (1)             2 NYOO   (20)
                                  22 JXX    (40u)
        MIXBLK      403            0 STORE1 (100)         100 STORE2 (100)         200 COVRGD (200)
                                 400 IMIX   (1)           401 LR     (1)           402 JJ     (1)
        MTO           2            0 OMTF   (1)             1 OMTR   (1)
        MXBLK         2            0 IGINT  (1)             1 ICBR   (1)
        NANLK         1            0 NLYST  (1)
        NBLK          8            0 NOG    (1)             1 NOH    (1)             2 NPT    (1)
                                   3 NX     (1)             4 NY     (1)             5 NOD    (1)
                                   6 NOSG   (1)             7 XK     (1)
        PQZ          20            0 TRPQZ  (20)
        PRVNT        58            0 ICYCLE (1)             1 FACTR1 (1)             2 FACTR2 (1)
                                   3 FACTR3 (1)             4 FRSTSL (1)             5 COSTR  (1)
                                   6 NRG    (1)             7 REPRG  (20)           27 IRG    (1)
                                  28 CRSL   (1)            29 PTCH   (1)            30 CLNDRN (1)
                                  31 JCYCLE (1)            32 CLNSWP (1)            33 SLCT   (1)
                                  34 COSTF  (1)            35 NFL    (1)            36 REPFL  (20)
                                  56 IFL    (1)            57 SCLPOP (1)
        PRVNT1        3            0 ISKIP  (1)             1 JISKIP (1)             2 IVM    (1)
        RDSTR        72            0 IMAN   (1)             1 NUMS   (1)             2 NOO    (10)
                                  12 CSTRT  (60)
        RESTR         3            0 IREST  (1)             1 JREST  (1)             2 ICOUNT (1)
        RLMN        530            0 JTYPE  (30)           30 NOACFT (500)
        RL1           7            0 K7     (1)             1 K4     (1)             2 EARTHWK(1)
                                   3 IDENT  (3)             6 FACTOR (1)
        RL2         813            0 NAME   (5)             5 LOCATE (8)            13 IDSCRPT(300)
                                 313 DSCRPT (150)         463 CHAR   (350)
        RODLOD        3            0 IDR    (1)             1 LZ     (1)             2 IDF    (1)
        SA            2            0 ALOS   (1)             1 WOS    (1)
        SBLK         12            0 SIGMA  (10)           10 S      (1)            11 SR     (1)
        SCAN3        62            0 JDL    (1)             1 NP     (1)             2 TRL    (10)
                                  12 TCY    (50)
        SGSWP2      242            0 XFP    (200)         200 NOGWT  (1)           201 NREX2  (1)
                                 202 COVM   (20)          222 DCOM   (20)
        SUBK          3            0 SUBD   (1)             1 IUBC   (1)             2 IDRY   (1)
        SZBK          2            0 MXTO   (1)             1 MNTO   (1)
        THKBK        40            0 THFF   (20)           20 TRKK   (20)
        TMPL          4            0 IND    (1)             1 SWID   (1)             2 TWOCL  (1)
                                   3 JACK   (1)
        TSV           6            0 THCK   (1)             1 ERCOST (1)             2 PSTEP  (1)
                                   3 CUTPRCE(1)             4 FILPRCE(1)             5 NERTH  (1)
        TYP           2            0 NRIGID (1)             1 NFLEX  (1)
        TYPBK         2            0 LMH    (1)             1 LFUNC  (1)
        WES         240            0 ESWL   (200)         200 AESWL  (10)          210 WHEELS (10)
                                 220 CBR    (20)
        ZONES        74            0 ZONSTEP(9)             9 APWID  (9)            18 APRSTR (27)
                                  45 APREND (27)           72 NAPR   (1)            73 APTOT  (1)

STATISTICS
  PROGRAM LENGTH                2633B      1435
  BUFFER LENGTH                15707B      7111
  CM LABELED COMMON LENGTH     10614B      4492
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```
    SUBROUTINE SORT        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     1

 1                   SUBROUTINE SORT(A,N)
                     DIMENSION A(20)
                     WRITE(6,1000)N,(A(I),I=1,N)
                     I=1
 5            7      IP= I
                     C= A(I)
                     J= I
             20      J= J+1
             27      IF(A(J) -C) 10,15,90
10           15       A(J)= A(N)
                     N=N-1
                     IF(J .LE. N) GO TO 27
                     GO TO 100
             10      C=A(J)
15                   IP= J
             90      IF(J .LT. N) GO TO 20
                     IF(IP .EQ. I) GO TO 100
                     TEMP= A(I)
                     A(I)= A(IP)
20                   A(IP)=TEMP
              100 I=I+1
                     IF(I.LT.N)GO TO 7
                     WRITE(6,1000)N,(A(I),I=1,N)
             1000 FORMAT(1H0,2X,I4,4X,10F10.0)
25                   IF(A(N).LT.99.) A(N+1)=100.
                     IF(A(N).LT.99.) N=N+1
                     RETURN
                     END


    SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
   4  SORT           1          27

VARIABLES      SN  TYPE            RELOCATION
   0  A            REAL       ARRAY     F.P.        REFS       2        3        6        9       10       14       18
                                                      19      23       25       26  DEFINED        1       10       19
                                                      20      25
 150  C            REAL                             REFS       9  DEFINED        6       14
 146  I            INTEGER                          REFS       3        5        6        7       17       18       19
                                                      21      22       23  DEFINED        3        4       21       23
 147  IP           INTEGER                          REFS      17       19       20  DEFINED        5       15
 151  J            INTEGER                          REFS       8        9       10       12       14       15       16
                                                 DEFINED       7        8
   0  N            INTEGER              F.P.        REFS     2*3       10       11       12       16       22     2*23
                                                    2*25    2*26  DEFINED        1       11       26
 152  TEMP         REAL                             REFS      20  DEFINED       18

FILE NAMES        MODE
      TAPE6       FMT                   WRITES         3      23
      SUBROUTINE SORT       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     2

STATEMENT LABELS                   DEF LINE   REFERENCES
    17  7                              5         22
    52  10                            14          9
     0  15          INACTIVE          10          9
    27  20                             8         16
    32  27                             9         12
    60  90                            16          9
   101  100                           21         13         17
   141  1000     FMT                  24          3         23

STATISTICS
  PROGRAM LENGTH                    1538       107
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```
SUBROUTINE GINT       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     1

           SUBROUTINE GINT (H,P,BP,AP,K,LD)
           DIMENSION A(99),B(99),D(99)
           DIMENSION H(LD),P(LD)
      3000 FORMAT(1H0,10X,21HLD IS GREATER THAN 99)
      4000 FORMAT("  INFINITE SLOPE IN INTERPOLATION  ")
      5000 FORMAT(/"  OUT OF RANGE OFF FIRST INDEX  ",2F10.2/)
      6000 FORMAT(/"  OUT OF RANGE OFF LAST  INDEX  ",2F10.2/)
      7000 FORMAT(//"  GINT IS CONFUSED  "//)
           IF(LD.GT.99) GO TO 12
           DO 38 I=1,K
           A(I)=H(I)
           B(I)=P(I)
      38   CONTINUE
           ISTOP=1
           JSTOP=1
           DO 30 I=1,K
           IF(ISTOP.EQ.2) GO TO 31
           IF(I.GT.1) GO TO 32
           BSAVE=B(I)
           IFRONT=0
           GO TO 31
      32   IF(ABS(BSAVE-B(I))-0.000001) 33,33,34
      33   BSAVE=B(I)
           IFRONT=IFRONT+1
           GO TO 31
      34   ISTOP=2
      31   J=K-I+1
           IF(JSTOP.EQ.2) GO TO 30
           IF(I.GT.1) GO TO 35
           BKEEP=B(J)
           IBACK=0
           GO TO 30
      35   IF(ABS(BKEEP-B(J))-0.000001) 36,36,37
      36   BKEEP=B(J)
           IBACK=IBACK+1
           GO TO 30
      37   JSTOP=2
      30   CONTINUE
           K=K-IFRONT-IBACK
           DO 39 I=1,K
           B(I)=B(I+IFRONT)
           A(I)=A(I+IFRONT)
      39   CONTINUE
           X=1000000000.
           IF(BP.GT.X) X=BP+1000000000.
           L=K
           DO 1  I=1,K
           D(I)=ABS(B(I)-BP)
           IF(X-D(I)) 2,3,3
      3    X=D(I)
           J=I
      2    CONTINUE
      1    CONTINUE
           Y=1000000.
           DO 4 N=1,L
           IF(N.EQ.J) GO TO 5
           IF(Y-D(N)) 5,6,6
```

```
 6    Y=D(N)
      M=N
 5    CONTINUE
 4    CONTINUE
      ITR=0
15    IF(ITR.EQ.2) GO TO 22
      IF(M.GT.J) K=M
      IF(J.GT.M) K=J
      BK=B(K)
      BJM=B(K-1)
      IF(BK.GT.BJM) GO TO 18
      IF((BP.GT.BJM).OR.(BP.LT.BK)) GO TO 14
      GO TO 19
18    IF((BP.GT.BK).OR.(BP.LT.BJM)) GO TO 14
      GO TO 19
14    IF((J.EQ.1).OR.(J.EQ.L)) GO TO 19
      IF(J.LT.M) GO TO 20
      M=J+1
      GO TO 21
20    M=J-1
21    CONTINUE
      ITR=ITR+1
      GO TO 15
19    CONTINUE
      IF(J.EQ.1) GO TO 7
      GO TO 8
 7    BP1=BP
      BP2=B(1)
      BP3=B(2)
      IF((BP1.GE.BP2).AND.(BP1.LE.BP3)) GO TO 10
      IF((BP1.LE.BP2).AND.(BP1.GE.BP3)) GO TO 10
      AP=A(1)
      WRITE(6,5000) AP,BP
      GO TO 11
 8    CONTINUE
      IF(J.EQ.L) GO TO 9
      GO TO 10
 9    BP1=BP
      BP2=B(L-1)
      BP3=B(L)
      IF((BP1.GE.BP2).AND.(BP1.LE.BP3)) GO TO 10
      IF((BP1.LE.BP2).AND.(BP1.GE.BP3)) GO TO 10
      AP=A(L)
      WRITE(6,6000) AP,BP
      GO TO 11
10    CONTINUE
      SL=A(K)-A(K-1)
      SLD=B(K)-B(K-1)
      IF(ABS(SLD)-0.0000001) 13,16,16
16    CONTINUE
      SL=SL/SLD
      IF(K.EQ.M) AP=A(K-1)+SL*(BP-B(K-1))
      IF(K.EQ.J) AP=A(K)-SL*(B(K)-BP)
11    CONTINUE
      K=K+IFRONT
      RETURN
   12 WRITE(6,3000)
```

```
      SUBROUTINE GINT       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE      3

 115               GO TO 17
              13   WRITE(6,4000)
                   GO TO 17
              22   WRITE(6,7000)
              17   CONTINUE
 120               STOP 0031
                   END


      SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE      REFERENCES
      4  GINT          1          113

  VARIABLES      SN  TYPE                RELOCATION
    576  A           REAL        ARRAY                   REFS         2        42        89       100     2*104       109       110
                                                      DEFINED        11        42
      0  AP          REAL                    F.P.        REFS        90       101   DEFINED         1        89       100       109
                                                          110
    741  B           REAL        ARRAY                   REFS         2        19        22        23        30        33        34
                                                           41        48        66        67        85        86        96        97
                                                        2*105       109       110   DEFINED        12        41
    570  BJM         REAL                                REFS        68        69        71   DEFINED        67
    567  BK          REAL                                REFS        68        69        71   DEFINED        66
    557  BKEEP       REAL                                REFS        33   DEFINED        30        34
      0  BP          REAL                    F.P.        REFS      2*45        48      2*69      2*71        84        90        95
                                                          101       109       110   DEFINED         1
    571  BP1         REAL                                REFS      2*87      2*88      2*98      2*99   DEFINED        84        95
    572  BP2         REAL                                REFS        87        88        98        99   DEFINED        85        96
    573  BP3         REAL                                REFS        87        88        98        99   DEFINED        86        97
    554  BSAVE       REAL                                REFS        22   DEFINED        19        23
   1104  D           REAL        ARRAY                   REFS         2        49        50        57        58
                                                      DEFINED        48
      0  H           REAL        ARRAY       F.P.        REFS         3        11   DEFINED         1
    551  I           INTEGER                             REFS      2*11      2*12        18        19        22        23        27
                                                           29      2*41      2*42      2*48        49        50        51
                                                      DEFINED        10        16        40        47
    560  IBACK       INTEGER                             REFS        35        39   DEFINED        31        35
    555  IFRONT      INTEGER                             REFS        24        39        41        42       112
                                                      DEFINED        20        24
    552  ISTOP       INTEGER                             REFS        17   DEFINED        14        26
    566  ITR         INTEGER                             REFS        63        79   DEFINED        62        79
    556  J           INTEGER                             REFS        30        33        34        56        64      2*65      2*73
                                                           74        75        77        82        93       110
                                                      DEFINED        27        51
    553  JSTOP       INTEGER                             REFS        28   DEFINED        15        37
      0  K           INTEGER                 F.P.        REFS        10        16        27        39        40        46        47
                                                           66        67     2*104     2*105     3*109     3*110       112
                                                      DEFINED         1        39        64        65       112
    562  L           INTEGER                             REFS        55        73        93        96        97       100
                                                      DEFINED        46
      0  LD          INTEGER                 F.P.        REFS       2*3         9   DEFINED         1
    565  M           INTEGER                             REFS      2*64        65        74       109   DEFINED        59        75
                                                           77
```

```
          SUBROUTINE GINT       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     4

 VARIABLES      SN  TYPE            RELOCATION
   564  N           INTEGER                           REFS        56         57         58         59   DEFINED        55
     0  P           REAL          ARRAY     F.P.      REFS         3         12    DEFINED          1
   574  SL          REAL                              REFS       108        109        110    DEFINED        104       108
   575  SLD         REAL                              REFS       106        108    DEFINED        105
   561  X           REAL                              REFS        45         49    DEFINED         44         45        50
   563  Y           REAL                              REFS        57    DEFINED         54         58

 FILE NAMES         MODE
        TAPE6       FMT                     WRITES         90        101        114        116        118

 INLINE FUNCTIONS    TYPE    ARGS         DEF LINE  REFERENCES
        ABS         REAL       1  INTRIN                  22         33         48        106

 STATEMENT LABELS                 DEF LINE    REFERENCES
     0  1                              53         47
   206  2                              52         49
     0  3              INACTIVE        50       2*49
     0  4                              61         55
   231  5                              60         56         57
     0  6              INACTIVE        58       2*57
   327  7                              84         82
   353  8                              92         83
   360  9                              95         93
   407  10                            103         87         88         94         98         99
   444  11                            111         91        102
   451  12                            114          9
   455  13                            116        106
   276  14                             73         69         71
   237  15                             63         80
     0  16             INACTIVE       107      2*106
   464  17                            119        115        117
   270  18                             71         68
   322  19                             81         70         72         73
   313  20                             77         74
   316  21                             78         76
   461  22                            118         63
   133  30                             38         16         28         32         36
    75  31                             27         17         21         25
    57  32                             22         18
     0  33             INACTIVE        23       2*22
    73  34                             26         22
   115  35                             33         29
     0  36             INACTIVE        34       2*33
   131  37                             37         33
     0  38                             13         10
     0  39                             43         40
   467  3000     FMT                    4        114
   474  4000     FMT                    5        116
   502  5000     FMT                    6         90
   510  6000     FMT                    7        101
   516  7000     FMT                    8        118

 LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
    23  38         I          10 13       11B          OPT
    42  30         I          16 38       74B          OPT
   143  39         I          40 43       13B          OPT
   171  1          I          47 53       20B          OPT
```

```
      SUBROUTINE GINT       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     5

LOOPS  LABEL     INDEX      FROM-TO     LENGTH    PROPERTIES
  215  4         N            55 61        178        OPT

STATISTICS
  PROGRAM LENGTH                 12718     697
```

```
SUBROUTINE COVSK       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE     1

              SUBROUTINE COVSK(XK,FS,RPAV)
              REAL PAVY(22),REFY(22),REF(2),CONFLX(11)
              INTEGER KK(2)
              REAL K500(11),K400(11),K300(11),K200(11),K100(11),K50(11),K25(11),
             1DEL(11)
              DATA REFY/4.,9.5,19.3,27.5,36.,43.,52.,58.5,67.,74.,83.,91.5,99.,
             1106.5,113.,123.,130.,137.,145.,150.,158.5,167./
              DATA PAVY/3.95,4.14,4.45,4.7,4.97,5.25,5.5,5.69,5.93,6.21,6.48,
             16.71,6.98,7.18,7.4,7.75,7.94,8.17,8.4,8.58,8.83,9.1/
              DATA CONFLX/800.,775.,750.,725.,700.,675.,650.,625.,600.,575.,
             A550./
              DATA K25/103.,108.,113.,118.5,123.5,130.,137.,143.5,150.,158.5,
             A167./
              DATA K50/87.,91.5,96.,101.,106.5,111.5,117.5,123.,130.5,138.,145./
              DATA K100/70.,73.5,78.5,83.,88.,93.,99.,105.,111.5,118.,125./
              DATA K200/52.5,57.5,61.,66.5,70.3,74.,80.,85.,91.5,98.5,104.5/
              DATA K300/38.,40.5,44.,48.5,52.,57.,61.5,67.,72.,77.5,82.5/
              DATA K400/21.5,25.,28.,31.5,36.,39.5,43.,48.5,53.,58.5,63./
              DATA K500/4.,6.5,9.5,13.,16.5,19.3,23.,27.5,32.,37.,40.5/
              IF(XK.GT.500..OR.XK.LT.25.)GO TO 98
              IF(FS.GT.800..OR.FS.LT.550.)GO TO 99
              IF(XK.LE.50.)  KL=25
              KH=50
              IF(KL.EQ. 25.)  GO TO 38
              IF(XK.LE.100..AND.XK.GT. 50.)  KL=50
               KH=100.
              IF(KL.EQ. 50.)  GO TO 38
              IF(XK.LE.200..AND.XK.GT.100.)  KL=100
              KH=200
              IF(KL.EQ.100.)  GO TO 38
              IF(XK.LE.300..AND.XK.GT.200.)  KL=200
              KH=300
              IF(KL.EQ.200.)  GO TO 38
              IF(XK.LE.400..AND.XK.GT.300.)  KL=300
              KH=400
              IF(KL.EQ.300.)  GO TO 38
              IF(XK.LE.500..AND.XK.GT.400.)  KL=400
              KH=500
       38     CONTINUE
              KK(1)=KL
              KK(2)=KH
              DO18  L=1,2
              K=KK(L)
              IF(K.EQ.25 )GO TO 25
              IF(K.EQ.50 )GO TO 50
              IF(K.EQ.100)GO TO 100
              IF(K.EQ.200)GO TO 200
              IF(K.EQ.300)GO TO 300
              IF(K.EQ.400)GO TO 400
              IF(K.EQ.500)GO TO 500
       25     DO 11 I=1,11
              DEL(I)=K25(I)
           11 CONTINUE
              GO TO 35
       50     DO 12 I=1,11
              DEL(I)=K50(I)
           12 CONTINUE
```

```
   SUBROUTINE COVSK       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE     2

                         GO TO 35
                   100   DO 13 I=1,11
   60                    DEL(I)=K100(I)
                      13 CONTINUE
                         GO TO 35
                   200   DO 14 I=1,11
                         DEL(I)=K200(I)
   65                 14 CONTINUE
                         GO TO 35
                   300   DO 15 I=1,11
                         DEL(I)=K300(I)
                      15 CONTINUE
   70                    GO TO 35
                   400   DO 16 I=1,11
                         DEL(I)=K400(I)
                      16 CONTINUE
                         GO TO 35
   75              500   DO 17 I=1,11
                         DEL(I)=K500(I)
                   17    CONTINUE
                  35     CONTINUE
                         KR=11
   80                    CALL GINT(DEL,CONFLX,FS,DUM,KR,11)
                         REF(L)=DUM
                  18     CONTINUE
                         DM=(XK-KL)/(KH-KL)*(REF(2)-REF(1))+REF(1)
                         KR=22
   85                    CALL GINT (PAVY,REFY,DM,RPAV,KR,22)
                         RETURN
                   98    WRITE(8,1001)XK
                   1001 FORMAT(/" COVSK-SUBGRADE MODULUS GREATER THAN 500 OR LESS THAN 25-
                        1OFF CHART,XK= ",F5.1)
   90                    GO TO 36
                   99    WRITE(8,1002)FS
                   1002 FORMAT(/"COVSK-CONCRETE FLEXURAL STRENGTH GREATER THAN 800 OR LESS
                        1 THAN 550-OFF CHART,FS= ",F5.1)
                   36    STOP 0041
   95                    END


   SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE      REFERENCES
    4  COVSK           1            86

VARIABLES        SN  TYPE              RELOCATION
  474  CONFLX        REAL       ARRAY                         REFS         2        80    DEFINED       10
  626  DEL           REAL       ARRAY                         REFS         4        80    DEFINED       52        56        60        64
                                                                68        72        76
  415  DM            REAL                                     REFS        85   DEFINED        83
  414  DUM           REAL                                     REFS        80        81
    0  FS            REAL                   F.P.              REFS      2*21        80        91   DEFINED         1
  412  I             INTEGER                                  REFS      2*52      2*56      2*60      2*64      2*68      2*72      2*76
                                                           DEFINED        51        55        59        63        67        71        75
```

```
     SUBROUTINE COVSK      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE     3

VARIABLES     SN  TYPE            RELOCATION
  411  K         INTEGER                            REFS        44        45        46        47        48        49        50
                                                 DEFINED        43
  407  KH        INTEGER                            REFS        41        83   DEFINED        23        26        29        32
                                                      35        38
  507  KK        INTEGER    ARRAY                   REFS         3        43   DEFINED        40        41
  406  KL        INTEGER                            REFS        24        27        30        33        36        40      2*83
                                                 DEFINED        22        25        28        31        34        37
  413  KR        INTEGER                            REFS        80        85   DEFINED        79        84
  565  K100      REAL       ARRAY                   REFS         4        60   DEFINED        15
  552  K200      REAL       ARRAY                   REFS         4        64   DEFINED        16
  613  K25       REAL       ARRAY                   REFS         4        52   DEFINED        12
  537  K300      REAL       ARRAY                   REFS         4        68   DEFINED        17
  524  K400      REAL       ARRAY                   REFS         4        72   DEFINED        18
  600  K50       REAL       ARRAY                   REFS         4        56   DEFINED        14
  511  K500      REAL       ARRAY                   REFS         4        76   DEFINED        19
  410  L         INTEGER                            REFS        43        81   DEFINED        42
  416  PAVY      REAL       ARRAY                   REFS         2        85   DEFINED         8
  472  REF       REAL       ARRAY                   REFS         2      3*83   DEFINED        81
  444  REFY      REAL       ARRAY                   REFS         2        85   DEFINED         6
    0  RPAV      REAL                 F.P.          REFS        85   DEFINED         1
    0  XK        REAL                 F.P.          REFS      2*20        22      2*25      2*28      2*31      2*34      2*37
                                                      83        87   DEFINED         1

FILE NAMES        MODE
     TAPE8      FMT                         WRITES        87        91

EXTERNALS           TYPE   ARGS       REFERENCES
     GINT                    6              80        85

STATEMENT LABELS            DEF LINE   REFERENCES
    0  11                           53        51
    0  12                           57        55
    0  13                           61        59
    0  14                           65        63
    0  15                           69        67
    0  16                           73        71
    0  17                           77        75
    0  18                           82        42
  156  25                           51        44
  254  35                           78        54        58        62        66        70        74
  316  36                           94        90
  117  38                           39        24        27        30        33        36
  167  50                           55        45
  307  98                           87        20
  313  99                           91        21
  200  100                          59        46
  211  200                          63        47
  222  300                          67        48
  233  400                          71        49
  244  500                          75        50
  342  1001    FMT                  88        87
  360  1002    FMT                  92        91

LOOPS  LABEL     INDEX      FROM-TO    LENGTH    PROPERTIES
  125  18      * L         42 82       142B                EXT REFS  NOT INNER
  157  11        I         51 53         6B       INSTACK
  170  12        I         55 57         6B       INSTACK
```

```
          SUBROUTINE COV5K        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     4

LOOPS  LABEL      INDEX       FROM-TO     LENGTH    PROPERTIES
  201  13          I           59 61          68     INSTACK
  212  14          I           63 65          68     INSTACK
  223  15          I           67 69          68     INSTACK
  234  16          I           71 73          68     INSTACK
  245  17          I           75 77          68     INSTACK

STATISTICS
  PROGRAM LENGTH                     651B      425
```

```
SUBROUTINE BASIN       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE     1

   1                 SUBROUTINE BASIN(GBM.BTE.EFK)
                     DIMENSION AKAY(5).WGCM(5.5)
                     DIMENSION EFXA(5)
                     REAL NSAG(5.5)
   5                 INTEGER GBM
                     COMMON /NBLK/ NOG,NOH,NPT,NX,NY,NOD,NOSG,XK
                     DATA AKAY /25.,50.,100.,200.,300./
                     DATA (WGCM(1.I),I=1,5) /50.,120.,190.,255.,310./
                     DATA (WGCM(2.I),I=1,5) /100.,190.,260.,325.,365./
  10                 DATA (WGCM(3.I),I=1,5) /195.,295.,365.,410.,465./
                     DATA (WGCM(4.I),I=1,5) /295.,365.,425.,490.,500./
                     DATA (WGCM(5.I),I=1,5) /370.,425.,475.,500.,500./
                     DATA (NSAG(1.I),I=1,5) /50.,110.,180.,230.,265./
                     DATA (NSAG(2.I),I=1,5) /95.,175.,235.,275.,300./
  15                 DATA (NSAG(3.I),I=1,5) /190.,270.,315.,330.,365./
                     DATA (NSAG(4.I),I=1,5) /280.,330.,360.,375.,385./
                     DATA (NSAG(5.I),I=1,5) /345.,380.,390.,400.,415./
                     DO 2 I=1,5
                     A=FLOAT(I-1)*10.
  20                 B=A+10.
                     J=I+1
                     IF((BTE.GE.A).AND.(BTE.LE.B)) GO TO 3
                2    CONTINUE
                3    DO 4 I=1,5
  25                 IF(GBM.EQ.2) GO TO 5
                     IF(J.EQ.2) EFKA(I)=AKAY(I)+(BTE-A)*(WGCM(I,J-1)-AKAY(I))/10.
                     IF(J.GT.2) EFKA(I)=WGCM(I,J-2)+(BTE-A)*(WGCM(I,J-1)-WGCM(I,J-2))/
                    110.
                     GO TO 6
  30            5    CONTINUE
                     IF(J.EQ.2) EFKA(I)=AKAY(I)+(BTE-A)*(NSAG(I,J-1)-AKAY(I))/10.
                     IF(J.GT.2) EFKA(I)=NSAG(I,J-2)+(BTE-A)*(NSAG(I,J-1)-NSAG(I,J-2))/
                    110.
                6    CONTINUE
  35            4    CONTINUE
                     DO 7 I=1,4
                     A=AKAY(I)
                     B=AKAY(I+1)
                     J=I+1
  40                 IF((XK.GE.A).AND.(XK.LE.B)) GO TO 8
                7    CONTINUE
                8    EFK=EFKA(J-1)+(XK-A)*(EFKA(J)-EFKA(J-1))/(B-A)
                     RETURN
                     END


SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
   4  BASIN           1           43

VARIABLES       SN  TYPE              RELOCATION
  163  A            REAL                               REFS        20         22        26        27        31        32        40
                                                        2*42   DEFINED        19        37
```

```
       SUBROUTINE BASIN      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      2

VARIABLES     SN  TYPE           RELOCATION
  166  AKAY      REAL       ARRAY                 REFS         2      2*26      2*31        37        38
                                               DEFINED         7
  164  B         REAL                             REFS        22        40        42   DEFINED        20        38
    0  BTE       REAL                F.P.         REFS      2*22        26        27        31        32
                                               DEFINED         1
    0  EFK       REAL                F.P.      DEFINED         1        42
  224  EFKA      REAL       ARRAY                 REFS         3      3*42   DEFINED        26        27        31        32
    0  GBM       INTEGER             F.P.         REFS         5        25   DEFINED         1
  162  I         INTEGER                          REFS        19        21      4*26      4*27      4*31      4*32        37
                                                    38        39   DEFINED        18        24        36
  165  J         INTEGER                          REFS      2*26      4*27      2*31      4*32      3*42
                                               DEFINED        21        39
    5  NOD       INTEGER            NBLK          REFS         6
    0  NOG       INTEGER            NBLK          REFS         6
    1  NOH       INTEGER            NBLK          REFS         6
    6  NOSG      INTEGER            NBLK          REFS         6
    2  NPT       INTEGER            NBLK          REFS         6
  231  NSAG      REAL       ARRAY                 REFS         4        31      3*32   DEFINED        13        14        15
                                                    16        17
    3  NX        INTEGER            NBLK          REFS         6
    4  NY        INTEGER            NBLK          REFS         6
  173  WGCM      REAL       ARRAY                 REFS         2        26      3*27   DEFINED         8         9        10
                                                    11        12
    7  XK        REAL               NBLK          REFS         6      2*40        42

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
         FLOAT   REAL        1  INTRIN               19

STATEMENT LABELS             DEF LINE   REFERENCES
    0  2                        23         18
   42  3                        24         22
    0  4                        35         24
   74  5                        30         25
  121  6                        34         29
    0  7                        41         36
  147  8                        42         40

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   20  2      * I          18 23      21B         OPT     EXITS
   43  4        I          24 35      61B         OPT
  126  7      * I          36 41      20B         OPT     EXITS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       NBLK          8               0 NOG   (1)                  1 NOH     (1)                  2 NPT     (1)
                                     3 NX    (1)                  4 NY      (1)                  5 NOD     (1)
                                     6 NOSG  (1)                  7 XK      (1)

STATISTICS
  PROGRAM LENGTH                274B     188
  CM LABELED COMMON LENGTH       108       8
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```
     SUBROUTINE COPY       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     1

     1                    SUBROUTINF COPY(NAME)
                          DIMENSION DATA(20),NAME(3),LABEL(3)
                          COMMON/IABLK/FACC.FACN.LT.IA
                          DATA IDSC/1H$/
     5                    REWIND 5
                          REWIND 7
                          REWIND 10
                       50 READ(10.1000)IDS.LABEL.FACC.FACN.LT.IA
                          IF(EOF(10))600.100
    10               100  DO 200 I=1.3
                          IF(LABEL(I).NE.NAME(I)) GO TO 50
                     200  CONTINUE
                      300 READ(10.3000)IDS.DATA
                          IF (IDS.EQ.IDSC) GO TO 400
    15                    WRITE (7.3000)IDS, DATA
                          GO TO 300
                      400 CONTINUE
                      500 READ(10.3000) IDS, DATA
                          IF (IDS.EQ.IDSC) GO TO 700
    20                    WRITE(5.3000) IDS, DATA
                          GO TO 500
                      600 WRITE(8.4000)(NAME(3),J=1.3)
                          STOP  0061
                      700 RETURN
    25               1000 FORMAT(A1.3A4.36X.2F10.5.7X.2I2)
                     3000 FORMAT(A1.19A4.A3)
                     4000 FORMAT(//" VEHICLE".3A4." NOT FOUND IN VEHICLE DATA BANK")
                          END


     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   4  COPY            1            24

VARIABLES      SN  TYPE             RELOCATION
  201  DATA        REAL       ARRAY                 REFS         2       15        20    DEFINED       13        18
    0  FACC        REAL                  IABLK      REFS         3    DEFINED       8
    1  FACN        REAL                  IABLK      REFS         3    DEFINED       8
  177  I           INTEGER                          REFS       2*11   DEFINED      10
    3  IA          INTEGER               IABLK      REFS         3    DEFINED       8
  176  IDS         INTEGER                          REFS        14       15        19        20    DEFINED        8        13
                                                    18
  105  IDSC        INTEGER                          REFS        14       19    DEFINED        4
  200  J         * INTEGER                        DEFINED       22
  225  LABEL       INTEGER    ARRAY                 REFS         2       11    DEFINED        8
    2  LT          INTEGER               IABLK      REFS         3    DEFINED       8
    0  NAME        INTEGER    ARRAY      F.P.       REFS         2       11        22    DEFINED        1

FILE NAMES         MODE
       TAPE10      FMT                   READS       8        13        18    MOTION        7
       TAPE5       FMT                   WRITES     20     MOTION        5
       TAPE7       FMT                   WRITES     15     MOTION        6
       TAPE8       FMT                   WRITES     22
       SUBROUTINE COPY       74/74    OPT=0 ROUND=*/ TRACE     FTN 4.6+420               09/02/77  13.54.00       PAGE     2

EXTERNALS          TYPE   ARGS       REFERENCES
       EOF       REAL       1             9

STATEMENT LABELS             DEF LINE   REFERENCES
   25  50                           8          11
    0  100         INACTIVE        10           9
    0  200                         12          10
   43  300                         13          16
   54  400                         17          14
   55  500                         18          21
   66  600                         22           9
  102  700                         24          19
  157  1000    FMT                 25           8
  163  3000    FMT                 26          13        15        18        20
  166  4000    FMT                 27          22

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   34  200    * I           10 12        6B     INSTACK    EXITS
   71         * J           22 22        4B              EXT REFS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       IABLK        4               0 FACC    (1)                   1 FACN   (1)                   2 LT     (1)
                                    3 IA      (1)

STATISTICS
  PROGRAM LENGTH                234B     156
  CM LABELED COMMON LENGTH        4B       4
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PROGRAM PACKET      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     1

      OVERLAY(LIFE,1,0)
      PROGRAM PACKET
      INTEGER GBM,ALIST,BLIST,CLIST,RLIST,FLEXVAL,RDLD1(10),RDLD2(10)
      DIMENSION BTAR(6),HBOND(3),HFPM(4),HLIST(3,32),GLIST(4,8)
     1   ,       TC(3) ,TA(6) ,RLIST(4),EATIT(6)
      DIMENSION REPFL(10,2),REPRG(10,2)
      COMMON /AMBLK/ MXN,IBN
      COMMON/BSBLK/IBTE,FDE,BTE,GBM
      COMMON /COND/ IC,ESC,DSC
      COMMON /CSTBK/ CCCST(50,10,2)
      COMMON /CUSR/ DLCF,DLCR
      COMMON /DMBLK/ TRST
      COMMON /DOBK/ ID,ITY,DT20,DT
      COMMON /DOM/ MNT
      COMMON /DRNBLK/ DRNCST,DRAIN
      COMMON /DRNBLK2/IDGWTO,IDIPO,EPO,DLO,PERMO,H30,LENGTHO,CAVCSTO,
     1FILCSTO,PIPCSTO,SLO,RNO,NOUTO,LOUTO
      COMMON /FCON/ IFCON
      COMMON /HBLK/ HH(10),TM(20)
      COMMON /LCY/ AXK,YK,TRY(20),FAC,LS,XCBR,XSTR
      COMMON /LYTD/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSBB,XMT(10,6),
     1NB,ZMT(3,4)
      COMMON /MANLK/ JMAN,MLYST,NYOO(20),JXX(20,20)
      COMMON/MIXBLK/STORE1(10,10),STORE2(10,10),COVRGD(10,20),IMIX
      COMMON /MTO/OMTF,OMTR
      COMMON/NBLK/ NOG,NOH,NPT,NX,NY,NOD,NOSG,XK
      COMMON /PRVNT/ICYCLE,FACTR1,FACTR2,FACTR3,FRSTSL,COSTR,NRG,REPRG,
     * IRG,  CRSL,PTCH,CLNDRN,JCYCLE,CLNSWP,SLCT,COSTF,NFL,REPFL,IFL
     * ,SCLPOP
      COMMON /PRVNT1/ ISKIP,JISKIP,IVM
      COMMON /RDSTR/ IMAN,NUMS,NOO(10),CSTRT(10,6)
      COMMON /RESTR/ IREST,JREST
C     ATYPE= JTYPE,  ADENT= IDENT,  AAME= NAME  AOCATE= LOCATE,
C     ADSCRP = IDSCRPT
      COMMON /RLMN/ ATYPE(3,10),NOACFT(50,10)
      COMMON /RL1/ K7,K4,EARTHWK,ADENT(3),FACTOR
      COMMON /RL2/ AAME(5),AOCATE(8), ADSCRP(30,10),DSCRPT(3,50),CHAR(7,
     150)
      COMMON/RODLOD/IDR,LZ,IDF
      COMMON /SA/ALOS,WOS
      COMMON /SCAN2/  ENTITY(20),NR,          MODE,VALUE,NCHAR,IO,ALIST
     1 (30),BLIST(30),CLIST(30),NLIST,SION,SIVE,NERR
      COMMON /SCAN3/ JDL,NP,TRL(10),TCY(50)
      COMMON /SUBK/ SUBD,IUBC,IDRY
      COMMON /TYP/ NRIGID,NFLEX
      COMMON /TYPBK/ LMH,LFUNC
      EQUIVALENCE (VALUE,IVALUE),(ENTITY(1),EMATCH,MATCH)
      DATA RDLD1/11,180,3500,48000,350000,1750000,7700000,25000000,
     170000000,182500000/,RDLD2/3100,13500,59000,260000,1150000,
     25000000,22500000,100000000,440000000,2000000000/
      DATA  CHAN/4HCHAN/,UNCH/4HUNCH/,DESI/4HDESI/,DESB/4HMAIN/,BLANK/4H
     1    /,TC/4HLIGH,4HMEDI,4HHEAV/,TA/1HA,1HB,1HC,1HD,1HE,1HF/
     2,DESC/2HLC/,EATIT/2HNO,4HPAVE,3HPPA,2HNO,3HYES,2HFD/
      DATA HGC,HIF,HSS,HCF /2HGC,2HIF,2HSS,2HCF/
      DATA  YES,HNO/ 3HYES,2HNO/,RIGI,FLEX/4HRIGI,4HFLEX/,BTAR/2HNO,
     1 4HESTI,4HTRAD,4HFROS,2HFT,3HFNT
     6                    /,HSAG,WGCM/4HNSAG,4HWGCM/,HBOND/4HPART,
     2 4HUNBO.4HBOTH/.HNONE/4HNONE/.STRA/4HSTRA/.HNORM,I DRY/4HNORM,3HDRY
     3 /.HCALC.HREAD/4HCALC.4HREAD/.HFPM/4HSUBG.4HCOMP.4HSUBB.4HBASE/.
     4 SCHE/4HSCHE/.RLIST/ 3HRIC.3HROS.3HFIC.3HFOS/.IAVAL.IBVAL/2HFI.
     5 2HRI/
C
C      HLIST DEFINES DSCRPT    (3A10)
C      HLIST (3.32)
       DATA  ((HLIST(I.J),I=1.3).J=1.27) / 10HRIGID PAVE. 4HMENT. 1H .
     1 10HRIGID PAVE. 9HMENT BASE. 1H . 10HFLEXIBLE P. 7HAVEMENT. 1H .
     2 10HDUMMY. NOT. 8H WRITTEN. 1H . 10HRIGID OVER. 10HLAY PARTIA. 6HL
     3 BOND. 10HRIGID OVER. 10HLAY. UNBON. 3HDED. 10HFLEXIBLE O. 6HVERLA
     4Y. 1H .      10HFIRST COMP. 10HACTED SUBG. 6HRADE  , 10HSECOND COM.
     5 10HPACTED SUB. 6HGRADE  . 10HTHIRD COMP. 10HACTED SUBG. 6HRADE  .
     6 10HFOURTH COM. 10HPACTED SUB. 6HGRADE  , 10HFIFTH COMP. 10HACTED
     7SUBG. 6HRADE  .  10HSIXTH COMP. 10HACTED SUBG. 6HRADE  . 10HSEVENT
     8H CO. 10HMPACTED SU. 6HBGRADE. 10HEIGHTH COM. 10HPACTED SUB. 6HGRA
     9DE . 10HNINETH COM. 10HPACTED SUB. 6HGRADE . 10HTENTH COMP. 10HACT
     1ED SUBG. 6HRADE  , 10HFIRST SUBB. 5HASE  . 1H . 10HSECOND SUB. 5HB
     2ASE . 1H . 10HTHIRD SUBB. 5HASE  . 1H . 10HFOURTH SUB. 5HBASE . 1H
     3 . 10HFIFTH SUBB. 5HASE  , 1H . 10HSIXTH SUBB. 5HASE  . 1H , 10HSE
     4VENTH SU. 5HBBASE. 1H , 10HEIGHTH SUB. 5HBASE . 1H , 10HNINETH SUB
     5. 5HBASE . 1H , 10HTENTH SUBB. 5HASE  . 1H /
       DATA  ((HLIST(I.J).I=1.3).J=28.32) / 10HIST FLEXIB. 10HLE PAVEMEN.
     1 6HT BASE. 10H2ND FLEXIB. 10HLE PAVEMEN. 6HT BASE. 10HROUTINE MA.
     2 9HINTENANCE. 1H . 10HROUTINE MA. 9HINTENANCE. 1H . 10HVEHICLE MA.
     3  9HINTENANCE. 1H /
C      GLIST IS USED TO DEFINE CHARACTERISTICS (7A4) CHAR(7.50)
       DATA                                         GLIST / 4HFIRS.4HT SE .
     1 4HGMEN  .4HT   .4HSECO.4HND S.4HEGME.4HNT  .4HTHIR.4HD SE.4HGMEN.
     2 4HT   .4HFOUR.4HTH S.4HEGME.4HNT  .4HFIFT.4HH SE.4HGMEN.4HT   .
     3 4HSIXT.4HH SE.4HGMEN.4HT   .4HSEVE.4HNTH .4HSEGM.4HENT .4HEIGH.
     4 4HTH S.4HEGME.4HNT  /
C                  DICTIONARY OF TERMS
C                          A L I S T    (A - FDE )
C      ALPHANUMERIC                    OPTIONAL                    NUMERIC
C       EART          1          CFP          10                              13
C       BOND          2          DRAI         11          CFS                 14
C       BT            3          CSFP         12          ER                  15
C       CLIM          4                                   CS                  16
C       COND          5                                   CSOA                17
C       CT            6                                   CSOG                18
C       DR            7                                   DCFO                19
C       DTYP          8                                   DISC                20
C       END           9                                   DCRO                21
C                                                         DL                  22
C                                                         DIR                 23
C                                                         COR                 24
C                                                         DIF                 25
C                                                                             26
C                                                         DTHI                27
C                                                                             28
C                                                         FD                  29
C                                                         CSR                 30
C
C      ------------------------------------------------------------------------
C
C                               B L I S T  (FO - RETU)
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      C     FPMP       101                            FPB          121
      C                102     PFP         114        GF           122
      C     GRM        103     ORR         115        OMR          123
      C     GO         104     FO          116        MTFO         124
      C     MCA        105     FP          117        ORFP         125
      C     GMC        106     LC          118        MTRO         126
      C                107                 119        NOSS         127
      C     IF         108     MD          120                     128
      C     IN         109                            PT           129
      C     OMFP       110                            LOS          130
      C     LOB        111
      C     NOB        112
      C     OR         113
      C
      C    -------------------------------------------------------------
      C
      C                        C L I S T  (RM - Z)
      C     RM         201                            ROT          219
      C                202     SJCR        212        RSR          220
      C     RSA        203     ROPB        213        WOS          221
      C     SCI        204     ROU         214        SC           222
      C     STFP       205     RP          215        SD           223
      C                206     RPB         216        SM           224
      C     ST         207     TA          217                     225
      C     VM         208     RSPR        218        SUBB         226
      C     TOO        209                            TIME         227
      C     VT         210                                         228
      C     WAND       211                            YT           229
           NERR= 0
           WRITE(10,902)
      902  FORMAT(1H1)
           NP=1
           CLNORN=0.
           JCYCLE=1
           FACTR1=0.02
           ICYCLE=7
           CRSL=0.01
           CLNSWP=.0
           SLCT=0.41
           FACTR2=0.
           PTCH=0.02
           FACTR3=2.
           COSTF=0.
           NFL=1
           COSTR=0.
           NRG=1
           IRG=0
           IFL=0
           SCLPOP=0.01
      C    GET THE NEXT ENTRY
       42  CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
       43  GO TO (46,46,50,50,46,46,46,46,44),MODE
       44  CALL RDLINE
           GO TO 42
       46  NW=(NCHAR+3)/4
           IF(MODE.EQ.1) VALUE = IVALUE
           NERR= NERR + 1
      WRITE(IO,900) MODE,VALUE,(ENTITY(I),I=1,NW)
  900 FORMAT(15H0ERROR.  MODE=  ,I3, 8HVALUE =  ,F12.4, 9H ENTITY =
     1 20A4)
      GO TO 42
C     ENTITY IS A LABEL OR NAME
   50 IF(MATCH .LT. IAVAL) GO TO 475
      IF(MATCH .LT. IBVAL) GO TO 480
      DO 455 I=1,NLIST
      IF( MATCH .EQ. CLIST(I)) GO TO 460
  455 CONTINUE
      GO TO 56
  460 ILOC= I
  461 CALL PARSF(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 463
      CALL RDLINE
      GO TO 461
  463 IF(MODE - 2) 462,465,466
  462 VALUE= IVALUE
  465 IF((ILOC.LT.12).AND.(ILOC.NE.8.AND.ILOC.NE.5))GO TO 468
  464 GO TO (201,299,203,204,205,299,207,208,209,210,211,212,213,214,215
     1 ,216,217,218,219,220,221,222,223,224,299,226,227,299,229,299),
     2 ILOC
  466 IF(ILOC .LT. 19 .AND. MODE .NE. 6) GO TO 464
  468 WRITE(IO,905) CLIST(ILOC)
      GO TO 43
  475 DO 55 I=1,NLIST
      IF( MATCH .EQ. ALIST(I)) GO TO 60
   55 CONTINUE
   56 NW=(NCHAR+3)/4
      NERR= NERR + 1
      WRITE(IO,901) (ENTITY(I),I=1,NW)
  901 FORMAT(72H0THE FOLLOWING NAME IS NOT IN THE SCAN DICTIONARY OR WAS
     1 IMPROPERLY USED  ,/,1X,20A4,/)
      GO TO 42
   60 ILOC= I
  625 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 63
      CALL RDLINE
      GO TO 625
   63 IF(MODE - 2) 62,65,66
   62 VALUE= IVALUE
   65 IF(ILOC.LT.10.AND.ILOC.GT.1) GO TO 68
   64 GO TO ( 1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 99, 14,
     1  15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 99, 27, 99, 29, 30),
     2  ILOC
   66 IF(ILOC.LT.13.AND.MODE.NE.6)GO TO 64
      IF((ILOC.EQ.24).AND.(MODE.NE.6))GO TO 64
      IF(ILOC.EQ.29.AND.MODE.NE.6)GO TO 64
      IF((ILOC.EQ.30).AND.(MODE.NE.6))GO TO 64
   68 WRITE(IO,905) ALIST(ILOC)
  905 FORMAT(28H0DATA DEFINING THE VARIABLE  ,A4,26H IS NOT IN THE PROPE
     1R MODE  )
      NERR= NERR + 1
      GO TO 43
  480 DO 481 I=1,NLIST
      IF( MATCH .EQ. BLIST(I)) GO TO 482
  481 CONTINUE
```

```
      GO TO 56
  482 ILOC= I
  483 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 484
      CALL RDLINE
      GO TO 483
  484 IF(MODE - 2) 485,486,488
  485 VALUE= IVALUE
  486 IF(ILOC.EQ.10.OR.ILOC.EQ.14) GO TO 487
      IF(ILOC .LT. 15)  GO TO 489
  487 GO TO (101,199,103,104,105,106,199,108,109,110,111,112,113,114,115
     1 ,116,117,118,199,120,121,122,123,124,125,126,127,199,129,130),
     2 ILOC
  488 IF(ILOC .LT. 21 .AND. MODE .NE. 6) GO TO 487
  489 WRITE(IO,905) BLIST(ILOC)
      GO TO 43
C
C        A L I S T
C
 99   WRITE(IO,918) TA(1),ILOC,ALIST(ILOC)
  918 FORMAT(*0PROGRAMMING ERROR.  THERE IS NO STATEMENT ASSIGNED FOR *,
     1  A1,*LIST(*,I2,*) = *,A4)
      GO TO 43
C     EARTHWORK
 1    IF(MODE.GT.2)GO TO 382
      EARTHWK=VALUE
      GO TO 42
  382 DO 383 I=1,3
      IF(EMATCH.EQ.EATIT(I))EARTHWK=I-1
  383 CONTINUE
      GO TO 42
C     BONDING
 2    IBN= 0
      DO 302 I=1,3
      IF(EMATCH .EQ. HBOND(I)) GO TO 304
  302 CONTINUE
      GO TO 56
  304 IBN= I
      GO TO 42
C     BASE.TRADEOFF
 3    IBTE=0
      DO 303 I=1,3
      IF(EMATCH.EQ.BTAR(I)) GO TO 305
  303 CONTINUE
      GO TO 56
  305 IBTE = I
      GO TO 42
C     CLIMATE
 4    IDRY= 0
      IF(EMATCH .EQ. HNORM) IDRY= 1
      IF(EMATCH .EQ. HDRY)  IDRY= 2
      IF(IDRY) 56,56,42
C     CONDITION
 5    IC=0
      IF(EMATCH.EQ.HGC) IC=1
      IF(EMATCH.EQ.HIF) IC=2
      IF(EMATCH.EQ.HSS) IC=3
      IF(EMATCH.EQ.HCF) IC=4
      IF(IC) 56,56,42
C     CALCULATION TYPE
  6   ID= 0
      IF(EMATCH.EQ.DESI) ID=3
      IF(EMATCH.EQ.DESC) ID=2
      IF(EMATCH .EQ. DESB) ID= 1
      IF(ID)  56,56,42
C     DESIGN.RESTRICTION
  7   IREST= 0
      IF(EMATCH .EQ. HNONE) IREST=1
      IF(EMATCH .EQ. RIGI) IREST= 2
      IF(EMATCH .EQ. FLEX) IREST= 3
      IF(IREST) 56,56,42
C     DESIGN TYPE (DTYPE)
  8   ITY = 0
      IF(EMATCH .EQ. RIGI) ITY= 1
      IF(EMATCH .EQ. FLEX) ITY= 2
      IF(ITY) 56,56,42
C     CRACKSEALING.FLEXIBLE.PAVEMENT
   10 CRSL=VALUE
      GO TO 42
C     DRAINAGE
  11  IF((MODE-2).GT.0)GO TO 384
      DRAIN=VALUE
      GO TO 42
  384 DO 385 I=4,6
      IF(EMATCH.EQ.EATIT(I))DRAIN=FLOAT(I-4)
  385 CONTINUE
      IF(DRAIN.NE.2)GO TO 42
      CALL PARSE (ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2)386,387,56
  387 IVALUE=(VALUE+0.001)
  386 IDIPO=IVALUE
      GO TO 42
C     CLEANING.SWEEPING.FLEXIBLE.PAVEMENT
   12 CLNSWP=VALUE
      GO TO 42
C     CONCRETE.FLEXURAL.STRENGTH
  14  XSTR= VALUE
      GO TO 42
C     ESCALATION.RATE
  15  ESC=VALUE
      GO TO 42
C     COMPACTED.SUBGRADE(I= 8 TO NCOM +7)
  16  IVALUE= VALUE + 0.001
      IF(IVALUE .GT. NCOM) GO TO 394
      I= IVALUE + 7
      J= IVALUE + 23
  396 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 397
      CALL RDLINE
      GO TO 396
  397 IF(MODE .EQ. 1) VALUE= IVALUE
      CALL CTABLE(I,J)
      GO TO 43
  394 WRITE(IO,912) IVALUE
  912 FORMAT(*0ERROR.  LESS THAN*,I5,* ITEMS HAVE BEEN DEFINED FOR THE C
     1ORRESPONDING MATERIAL IN THE MATERIAL PROPERTIES TABLE.*)
      NERR= NERR + 1
      GO TO 42
C
C     CONCRETE.STRESSES.OVER.ASHPHALT
 17   I= 0
 376  I= I+1
      STORE2(IMIX,I)= VALUE
 377  CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 378
      CALL RDLINE
      GO TO 377
 378  IF(MODE - 2) 379,376,374
 379  VALUE= IVALUE
      GO TO 376
C     CONCRETE.STRESSES.ON.GRADE
 18   I= 0
 370  I=I+1
      STORE1(IMIX,I)= VALUE
 371  CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 372
      CALL RDLINE
      GO TO 371
 372  IF(MODE - 2) 373,370,374
 373  VALUE= IVALUE
      GO TO 370
 374  IF(I.EQ. 10) GO TO 43
      NERR= NERR + 1
      WRITE(IO,911)  I
 911  FORMAT(*0ERROR.  10 STRESSES ARE REQUIRED,*,I10,* STRESSES WERE RE
     1AD*)
      GO TO 43
C     DELAY.COSTS.FLEXIBLE.OVERLAY
 19   DLCF= VALUE
      GO TO 42
C     DISCOUNT
 20   DSC=VALUE
      GO TO 42
C     DELAY.COSTS.RIGID.OVERLAY
 21   DLCR= VALUE
      GO TO 42
C     DESIGN LIFE
 22   JDL= VALUE + 0.001
      GO TO 42
C     DESIGN.INDEX.RIGID
 23   IVALUE=VALUE+0.001
      IDR=IVALUE
      IVALUE=HOLD1(IDR)
      IVALUE=IVALUE/JDL
      IF(IVALUE.EQ.0)IVALUE=1
      DO 87 I=1,JDL
 87   NOACFT(I,IMIX)=IVALUE
      GO TO 42
C     CLASS.OF.ROAD
 24   DO 293 I=1,6
      IF(EMATCH.EQ.TA(I))GO TO 294
  293 CONTINUE
      GO TO 56
  294 LFUNC=I
      GO TO 42
C     DESIGN.INDEX.FLEXIBLE
   25 FLEXVAL=VALUE+0.001
      IDF=FLEXVAL
      FLEXVAL=RDLD2(IDF)
      FLEXVAL=FLEXVAL/JDL
      DO 88  I=1,JDL
   88 NOACFT(I,2)=FLEXVAL
      GO TO 42
C     DTHI (DESIGN THICKNESS)
   27 DT= VALUE
      GO TO 42
C     FROST.DESIGN
   29 IFD=-1
      IF(EMATCH.EQ.HNO)IFD=0
      IF(EMATCH.EQ.HCALC)IFD=2
      IF(EMATCH.NE.HREAD)GO TO 388
      IFD=1
      CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2)291,292,56
  291 VALUE=IVALUE
  292 FDE=VALUE
      GO TO 42
  388 IF(IFD)56,42,42
C     CLEANING.SWEEPING.RIGIDPAVEMENT
   30 FACTR2=VALUE
      GO TO 42
C
C        B L I S T
C
  199 WRITE(IO,918) TA(2),ILOC,BLIST(ILOC)
      GO TO 43
C     FLEXIBLE.PAVEMT.MATERIAL.PROPERTIES
  101 DO 345 I=1,4
      IF(EMATCH .EQ. HFPM(I)) GO TO 346
  345 CONTINUE
      GO TO 43
  346 GO TO (351,352,353,354),I
C     SUBGRADE, NNNAT
  351 CALL PLABAY(I,YCBR,NNAT)
      GO TO 101
C     COMPACTED.SUBGRADE, NCOM
  352 CALL PLABAY(I,ZCBR,NCOM)
      GO TO 101
C     SUBBASE, NSBB
  353 CALL PLABAY(I,XMT,NSBB)
      GO TO 101
C     BASE, NB
  354 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE -2) 355,356,357
  357 IF(MODE .EQ. 9) GO TO 358
      NW= (NCHAR+3)/4
      NERR= NERR+1
      WRITE(IO,901) (ENTITY(J),J=1,NW)
      GO TO 101
  358 CALL RDLINE
      GO TO 354
  356 IVALUE= VALUE + 0.001
  355 NR= IVALUE
      IF(NR .GT. NB) NB= NR
  359 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE - 2) 360,361,362
  362 IF(MODE .LT. 9) GO TO 367
      CALL RDLINE
      GO TO 359
  360 VALUE= IVALUE
  361 ZMT(NR,1)= VALUE
  363 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 364
      CALL RDLINE
      GO TO 363
  364 IF(MODE .GT. 2) GO TO 101
      NW= (NCHAR+3)/4
      WRITE(IO,909)  (ENTITY(J),J=1,NW)
  909 FORMAT(*0THE FOLLOWING ENTITY IS OUT OF SEQUENCE*,/,1X,20A4)
      NERR= NERR +1
      GO TO 363
  367 NERR= NERR + 1
      NW= (NCHAR+3)/4
      WRITE(IO,901) (ENTITY(J),J=1,NW)
      GO TO 101
C     GRANULAR.BASE.MATERIAL
  103 GBM= 0
      IF(EMATCH .EQ. WGCM) GBM= 1
      IF(EMATCH .EQ. HSAG) GBM= 2
      IF(GBM) 56,56,42
C     GENERAL DESCRIPTION
  104 DO 449 I=1,10
      J= 0
      DO 448 K=1,2
      NW= (NCHAR+3)/4
      IF(K.EQ. 2) GO TO 438
      IF(NW .GT. 14) GO TO 435
      I1= 15-NW
      DO 434 I2=1,I1
      J=J+1
  434 ADSCRP(J,I)= BLANK
  435 DO 436 I2=1,NW
      J=J+1
  436 ADSCRP(J,I)= ENTITY(I2)
      GO TO 444
  438 IF(NW .GT. 30-J)  NW= 30-J
      DO 440 I2=1,NW
      J=J+1
  440 ADSCRP(J,I)= ENTITY(I2)
      IF(J .GT. 29) GO TO 444
      I1=J+1
      DO 442 J=I1,30
  442 ADSCRP(J,I)= BLANK
  444 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 446
      CALL RDLINE
      GO TO 444
  446 IF(MODE .NE. 7) GO TO 450
  448 CONTINUE
  449 CONTINUE
      I=10
  450 K7= I
      GO TO 43
C     MAINTENANCE.COST.ANALYSIS
  105 ISKIP=0
      IF(EMATCH.EQ.4HYES ) ISKIP=2
      IF(EMATCH.EQ. HNO  ) ISKIP=1
      IF(ISKIP) 56,56,42
C     GENERATE.MATERIAL.COMBINATIONS
  106 JMAN= 0
      IF(EMATCH .EQ. YES) JMAN= 1
      IF(EMATCH .EQ. HNO) JMAN= 2
      IF(JMAN) 56,56,42
C     INITIAL.FAILURE
  108 IFCON= 0
      IF(EMATCH.EQ. HNO) IFCON= 1
      IF(EMATCH.EQ. YES) IFCON= 2
      IF(EMATCH) 56,56,42
C     IDENTIFICATION.NUMBER
  109 NW= (NCHAR+3) /4
      IF(NW .GT.3) NW=3
      DO 424 I=1,NW
  424 ADENT(I)= ENTITY(I)
      IF(NW .GT. 2) GO TO 42
      NW=NW+1
      DO 426 I=NW,3
  426 ADENT(I)= BLANK
      GO TO 42
C     OTHER.MAINTENANCE.FLEXIBLE.PAVEMENT
  110 COSTF=VALUE
      CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE.NE.1)GO TO 46
      NFL=IVALUE
      GO TO 42
C     LOCATION.OF.BASE
  111 NW= (NCHAR+3)/4
      IF(NW .GT. 8) NW= 8
      DO 428 I=1,NW
  428 AOCATE(I)= ENTITY(I)
      IF(NW .GT. 7) GO TO 42
      NW= NW+1
      DO 430 I=NW,8
  430 AOCATE(I)=  BLANK
      GO TO 42
C     NAME.OF.BASE
  112 NW= (NCHAR+3)/4
      IF(NW .GT. 5) NW = 5
      DO 420 I=1,NW
  420 AAME(I)= ENTITY(I)
      IF(NW .GT. 4) GO TO 42
      NW=NW+1
  422 AAME(I)= BLANK
```

```
             GO TO 42
      C      OVERLAY.RESTRICTION
       113   JREST= 0
             IF(EMATCH .EQ. HNONE) JREST=1
             IF(EMATCH .EQ. RIGI)  JREST=2
             IF(EMATCH .EQ. FLEX)  JREST=3
             IF(JREST) 56,56,42
      C      PATCHING.FLEXIBLE.PAVEMENT
        114  PTCH=VALUE
             GO TO 42
      C      OTHER.REPAIRS.RIGIDPAVEMENT
        115  I=1
       812   REPRG(I,1)=VALUE
             CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
             IF(MODE-2)813,814,46
       813   VALUE=IVALUE
       814   REPRG(I,2)=VALUE
             CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
             IF(MODE.EQ.9)CALL RDLINE
             IF(MODE.EQ.9) CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
             IF(MODE.GT.2) IRG=I
             IF(MODE.GT.2) GOTO 43
             I=I•1
             IF(MODE.EQ.1)VALUE=IVALUE
             GO TO 812
      C      FLEXIBLE.OVERLAY
       116   CALL CTABLE(7,23)
             GO TO 43
      C      FLEXIBLE.PAVEMENT
       117   CALL CTABLE(3,19)
             GO TO 43
      C      LOAD.CATEGORY
       118   IF(MODE .GT. 2) GO TO 90
             LMH= VALUE • 0.001
             GO TO 42
       90    DO 94 I=1,3
             IF(EMATCH .EQ. TC(I)) GO TO 95
       94    CONTINUE
             GO TO 56
       95    LMH=I
             GO TO 42
      C      MAINTAIN.DRAINS
        120  CLNDRN=VALUE
             CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
             IF(MODE.NE.1)GO TO 46
             JCYCLE=IVALUE
             GO TO 42
      C      FLEXIBLE.PAVEMENT.BASE
       121   IVALUE= VALUE • 0.001
             IF((IVALUE.GT.NB).A.(ID.EQ.3)) GO TO 394
             I= IVALUE • NCOM • NSBB • 7
             J= IVALUE • 43
             GO TO 396
      C      GEOGRAPHICAL.FACTOR
       122   FACTOR= VALUE
             GO TO 42
      C      OTHER.MAINTENANCE.RIGIDPAVEMENT
```

```
  123 COSTR=VALUE
      CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE.NE.1)GO TO 46
      NRG=IVALUE
      GO TO 42
C     MINIMUM.THICKNESS.FLEXIBLE.OVERLAY
  124 OMTF=VALUE
      GO TO 42
C     OTHER.REPAIRS.FLEXIBLE.PAVEMENT
  125 I=1
  821 REPFL(I,1)=VALUE
      CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2)822,823,46
  822 VALUE=IVALUE
  823 REPFL(I,2)=VALUE
      CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE.EQ.9)CALL RDLINE
      IF(MODE.EQ.9) CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE.GT.2) IFL=I
      IF(MODE.GT.2) GOTO 43
      I=I+1
      IF(MODE.EQ.1)VALUE=IVALUE
      GO TO 821
C     MINIMUM.THICKNESS.RIGID.OVERLAY
  126 OMTR=VALUE
      GO TO 42
C     NO.OF.SUBBASE.SCHEMES
  127 MLYST= VALUE + 0.001
      GO TO 42
C     PAST.TRAFFIC
  129 TRL(IMIX)= VALUE
      GO TO 42
C     LENGTH.OF.SECTION
  130 ALOS=VALUE
      GO TO 42
C
C        C L I S T
C
  299 WRITE(IO,918) TA(3),ILOC,CLIST(ILOC)
      GO TO 43
C     ROUTINE.MAINTENANCE (FOR RIC,ROS,FIC,AND FOS)
  201 JISKIP=1
      DO 398 K=1,4
      IF( MATCH .EQ. RLIST(K)) GO TO 399
  398 CONTINUE
      GO TO 56
  399 IF(K .GT.2) K=K+1
      I= NCOM + NSBB + NB + 7 + K
      J= K + 45
      GO TO 396
C     RIGID.STRUCTURAL.ANALYSIS
  203 NRIGID= 0
      IF(EMATCH .EQ. HCALC) NRIGID= 1
      IF(EMATCH .EQ. HREAD) NRIGID= 2
      IF(NRIGID) 56,56,42
C     SUBGRADE.COHESION.INDEX
  204 IUBC= 0
```

```
      IF(ENTITY(2) .EQ. SION)GO TO 317
      IF(ENTITY(2) .EQ. SIVE)GO TO 318
  317 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(EMATCH.EQ.3HNFS)IUBC=1
      IF(EMATCH.EQ.2HFS)IUBC=3
      IF(IUBC) 56,56,42
  318 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(EMATCH.EQ.3HNFS)IUBC=2
      IF(EMATCH.EQ.2HFS)IUBC=4
      IF(IUBC) 56,56,42
C     SURFACE.TREATMENT.FLEXIBLE.PAVEMENT
  205 SLCT=VALUE
      GO TO 42
C     SUBBASE.TYPES
  207 NSGY= 0
  306 IF(EMATCH .NE. SCHE) GO TO 307
  315 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2) 309,308,314
  308 IVALUE= VALUE + 0.001
  309 I=IVALUE
      J=0
      NSGY=NSGY+1
  310 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2) 312,311,316
  311 IVALUE= VALUE + 0.001
  312 J=J+1
      JXX(I,J)= IVALUE
      GO TO 310
  313 NYOO(I)= J
      GO TO 306
  307 IF(NSGY .EQ. MLYST) GO TO 43
      NERR= NERR+1
      WRITE(IO,904) MLYST,NSGY
  904 FORMAT(*0ERROR. NO.SUBBASE.SCHEMES =*,I10,* BUT ONLY*,I10,* WERE E
     1NCOUNTERED*)
      GO TO 43
  314 IF(MODE .NE. 9) GO TO 307
      CALL RDLINE
      GO TO 315
  316 IF(MODE .NE. 9) GO TO 313
      CALL RDLINE
      GO TO 310
C     VEHICLE.MAINTENANCE
  208 IVM=1
      I=NCOM+NSBB+NB+10
      CALL CTABLE(I,48)
      GO TO 43
C
C     TIMES.OF.OVERLAYS
  209 NUMS= 0
  321 IF(EMATCH .NE. STRA) GO TO 43
  322 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2) 324,323,329
  323 IVALUE= VALUE + 0.001
  324 I=IVALUE
      J= 0
      NUMS= NUMS+1
  325 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE-2) 326,327,330
  326 VALUE= IVALUE
  327 J=J+1
      CSTRT(I,J)= VALUE
      GO TO 325
  329 IF(MODE .NE. 9) GO TO 43
      CALL RDLINE
      GO TO 322
  330 IF(MODE .NE. 9) GO TO 331
      CALL RDLINE
      GO TO 325
  331 NOO(I)= J
      GO TO 321
C     VEHICLE.TYPE
  210 NW=(NCHAR+3)/4
      IMIX=IMIX+1
      DO 146 I=1,NW
  146 ATYPE(I,IMIX)=ENTITY(I)
      IF(ENTITY(1).EQ.4HROAD)LZ=3
      IF(NW.GE.3)GO TO 42
      NW=NW+1
      DO 150 I=NW,3
  150 ATYPE(I,IMIX)=BLANK
      GO TO 42
C
C     WANDER
  211 NP= 0
      IF(EMATCH .EQ. CHAN) NP= 1
      IF(EMATCH .EQ. UNCH) NP= 2
      IF(NP) 56,56,42
C     SEAL.JOINS.CRACKS.RIGIDPAVEMENT
   212 FACTR1=VALUE
      CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE.NE.1)GO TO 46
      ICYCLE=IVALUE
      GO TO 42
C     RIGID.OVERLAY.PARTIAL.BOND
  213 CALL CTABLE(5,21)
      GO TO 43
C     RIGID.OVERLAY.UNBONDED
  214 CALL CTABLE(6,22)
      GO TO 43
C     RIGID.PAVEMENT
  215 CALL CTABLE(1,17)
      GO TO 43
C     RIGID.PAVEMENT.BASE
  216 CALL CTABLE(2,18)
      GO TO 43
C     TRAFFIC.AREA
  217 DO 504 I=1,4
      IF(EMATCH .EQ. TA(I)) GO TO 505
  504 CONTINUE
      GO TO 56
  505 LFUNC= I
      GO TO 42
C     REPAIR.SCALES.POPOUTS.RIGIDPAVEMENT
```

```
  218  SCLPOP=VALUE
       GOTO 42
C      RANGE OF THICKNESSES
  219  HH(1)= VALUE
  339  CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
       IF(MODE - 2) 340,341,342
  340  HH(10)= IVALUE
       GO TO 42
  341  HH(10)= VALUE
       GO TO 42
  342  IF(MODE .EQ. 9) GO TO 343
       NERR= NERR + 1
       WRITE(IO,906)
  906  FORMAT(*OTHE INPUT ITEM --RANGE.OF.THICKNESSES-- SHOULD BE FOLLOWE
      1D BY TWO PARAMETERS*,/,* ONLY ONE PARAMETER WAS ENCOUNTERED. PLEAS
      2E CHECK INPUT DATA*)
       GO TO 43
  343  CALL RDLINE
       GO TO 339
C      REPLACE.SLABS.RIGIDPAVEMENT
   220 FACTR3=VALUE
       GO TO 42
C      WIDTH.OF.SECTION
  221  WOS= VALUE
       GO TO 42
C      SUBGRADE.CBR
  222  XCBR = VALUE
       GO TO 42
C      SUBGRADE.DENSITY
  223  SUBD= VALUE
       GO TO 42
C      SUBGRADE MODULUS ( K VALUE )
  224  XK= VALUE
       GO TO 42
C      SUBBASE (I= NCOM+8 TO NCOM+NSBB+7)
  226  IVALUE= VALUE + 0.001
       IF(IVALUE .GT. NSBB) GO TO 394
       I= IVALUE +NCOM + 7
       J= IVALUE + 33
       GO TO 396
C      TIMES
  227  LS=0
  333  LS= LS+1
       TM(LS)= VALUE
  336  CALL PARSE(ENTITY,MODE,VALUE,WCHAR)
       IF(MODE - 2) 334,333,335
  334  VALUE= IVALUE
       GO TO 333
  335  IF(MODE .NE. 9) GO TO 43
       CALL RDLINE
       GO TO 336
C
C      YEARLY TRAFFIC
  229  I= 0
  165  IVALUE= VALUE + 0.001
  158  I= I+1
       NOACFT(I,IMIX)= IVALUE
  160 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .NE. 9) GO TO 164
      CALL RDLINE
      GO TO 160
  164 IF(MODE - 2) 158,165,167
  167 IF(I .EQ. JDL) GO TO 43
      WRITE(IO,903) I,JDL,I
  903 FORMAT(22H0WARNING.  A TOTAL OF ,I4,50H VARIABLES HAVE BEEN SPECIF
     1IED FOR YEARLY TRAFFIC. ,/,45H HOWEVER, THE DESIGN LIFE WAS SPECIF
     2IED TO BE ,I4, 7H YEARS. ,/,52H THEREFORE, THE DESIGN LIFE HAS BEE
     3N REDEFINED TO BE ,I4, 7H YEARS. )
      JDL= I
      GO TO 43
C     STOP
  888 WRITE(IO,910) NERR
  910 FORMAT(1H0,I10,* ERRORS HAVE BEEN ENCOUNTERED.  JOB TERMINATED.*)
      STOP 1011
C     COMPLETE CCCST ARRAY
    9 K=1
      CCCST(4,1,1)= 0.
      I3= 1
      J= NCOM+NSBB+NB+12
      DO 414 I=1,J
      ISKP= 1
      CCCST(I,1,2)= K
C     I1= NUM OF SEGMENTS FOR LINE I
      I1= CCCST(I,1,1) + 0.001
      IF(I1 .LT. 1) GO TO 416
      I5= I3+16
      IF(I3 .GT. 32) I3= 30
C     TRANSFER LABELS TO PROPER LOCATION IN DSCRPT
      DO 402 I2=1,3
  402 DSCRPT(I2,K)= HLIST(I2,I3)
      K2= K
      DO 412 I4= 1,I1
      IF(I4 .GT. 1) GO TO 406
      IF(CHAR(1,I5) .EQ. BLANK) GO TO 406
      DO 404 I2=1,7
  404 CHAR(I2,K2)= CHAR(I2,I5)
      GO TO 412
  406 DO 408 I2=1,4
  408 CHAR(I2,K2)= GLIST(I2,I4)
      DO 410 I2=5,7
  410 CHAR(I2,K2)= BLANK
  412 K2=K2+1
      IF(I .EQ. J) GO TO 418
      I3= I5-16
C     K = THE NUMBER OF THE FIRST SEGMENT CUMULATIVELY
      K= K + I1
  416 IF(I .EQ. NCOM+7) ISKP= ISKP +10-NCOM
      IF(I .EQ. NCOM+NSBB+7) ISKP= ISKP + 10-NSBB
      IF(I .EQ. NCOM+NSBB+NB+7) ISKP= ISKP + 2-NB
      I3= I3 + ISKP
  414 CONTINUE
C     RETURN
  418 CONTINUE
      IF(NERR.NE.0)GO TO 888
```

```
           TRST=DSC-ESC-DSC*ESC
           ENDFILE 2
           REWIND 2
           IF(IFD.EQ.1.AND.IBTE.EQ.3)IBTE=4
           IF(IFD.EQ.2.AND.IBTE.EQ.3)IBTE=5
           IF(IFD.EQ.2.AND.IBTE.EQ.1)IBTE=6
           IF(DRAIN.EQ.0.)GO TO 77
           READ(12,9999)    IDGWTO,IDIPO,EPO,DLO,PERMO,H30,LENGTHO,CAVCSTO,
          1FILCSTO,PIPCSTO,SLO,RNO,NOUTO,LOUTO
      9999 FORMAT(10X,2(I3),F4.3,F5.1,E8.2,F5.2,I5,3(F5.2),2(F5.4),I1,I3)
           REWIND 12
           WRITE(12,9050)
      9050 FORMAT(1H1,10(/),56X,18H******************/
          1                    56X,18H*                */
          2                    56X,18H*    DRAINAGE    */
          3                    56X,18H*                */
          4                    56X,18H*    SUMMARY     */
          5                    56X,18H*                */
          6                    56X,18H******************)
           WRITE(12,9051)   IDGWTO,IDIPO,EPO,DLO,PERMO,H30,LENGTHO,CAVCSTO,
          1FILCSTO,PIPCSTO,SLO,RNO,NOUTO,LOUTO
      9051 FORMAT(5(/),T10,"DEPTH TO GROUND WATER TABLE"T45,I3,/T10,"USERS DE
          1PTH TO PIPE",T45,I3,/T10,"EFFECTIVE POROSITY",T45,F4.3,/T10,"DRAIN
          2AGE LENGTH",T45,F5.1,/T10,"PERMEABILITY",T45,E8.2,/T10,"HEIGHT OF
          3CROSS SLOPE",T45,F5.2,/T10,"LENGTH",T45,I5,/T10,"EXCAVATION COST",
          4T45,F5.2,/T10,"FILTER MATERIAL COST",T45,F5.2,/T10,"COST OF PIPE",
          5T45,F5.2,/T10,"LONGITUDINAL SLOPE",T45,F5.4,/T10,"MANNING ROUGHNES
          6S FACTOR",T45,F5.4,/T10,"OUTLET CODE",T45,I1,/T10,"AVERAGE LENGTH
          7OF OUTLET PIPE",T45,I3)
           WRITE(12,9052)
      9052 FORMAT(1H1,/T4,"SCHEME",T18,"ANALYSIS",T34,"TOP OF PAVEMENT    PIP
          1E   NUMBER OF  NUMBER   COST PER",T94,"TOTAL",T104,"NOTES",/T35,
          2"TO CENTERLINE     DIA.    OUTLETS  OF LINES LINEAL FOOT",T95,
          3"COST",/T34,"OF PIPE (INCHES) (INCHES) PER LINE",//)
      77   CALL CKDATA
           END
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CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

   922      I      27CD 922  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.
   922      I      60CD 922  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.
   934      I      60CD 935  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.
   934      I      49CD 939  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.
   934      I      24CD 940  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.


     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
   3 PACKET          2
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          PROGRAM PACKET     74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    18

VARIABLES    SN  TYPE           RELOCATION
    0 AAME     REAL     ARRAY  RL2        REFS        37   DEFINED       567       570
    3 ADENT    REAL     ARRAY  RL1        REFS        36   DEFINED       541       545
   15 ADSCRP   REAL     ARRAY  RL2        REFS        37   DEFINED       499       502       507       511
   31 ALIST    INTEGER  ARRAY  SCAN2      REFS         3        41       198       221       248
    0 ALOS     REAL            SA         REFS        40   DEFINED       661
    5 AOCATE   REAL     ARRAY  RL2        REFS        37   DEFINED       557       561
    0 ATYPE    REAL     ARRAY  RLMN       REFS        35   DEFINED       760       765
    0 AXK      REAL            LCY        REFS        20
 3610 BLANK    REAL                       REFS       499       511       545       561       570       765       892
                                           899   DEFINED        51
   67 BLIST    INTEGER  ARRAY  SCAN2      REFS         3        41       227       243       433
 4467 BTAR     REAL     ARRAY             REFS         4       271   DEFINED        55
    2 BTE      REAL            BSBLK      REFS         8
    7 CAVCSTO  REAL            DRNBLK2    REFS        16       932   DEFINED       920
    0 CCCST    REAL     ARRAY  CSTBK      REFS        10       882   DEFINED       875       880
 3604 CHAN     REAL                       REFS       770   DEFINED        51
  717 CHAR     REAL     ARRAY  RL2        REFS        37       892       894   DEFINED       894       897       899
  125 CLIST    INTEGER  ARRAY  SCAN2      REFS         3        41       180       195       666
   36 CLNDRN   REAL            PRVNT      REFS        27   DEFINED       147       613
   40 CLNSWP   REAL            PRVNT      REFS        27   DEFINED       152       322
   42 COSTF    REAL            PRVNT      REFS        27   DEFINED       157       548
    5 COSTR    REAL            PRVNT      REFS        27   DEFINED       159       628
  310 COVRGD   REAL     ARRAY  MIXBLK     REFS        24
   34 CRSL     REAL            PRVNT      REFS        27   DEFINED       151       306
   14 CSTRT    REAL     ARRAY  RDSTR      REFS        31   DEFINED       746
 3607 DESB     REAL                       REFS       292   DEFINED        51
 3611 DESC     REAL                       REFS       291   DEFINED        51
 3606 DESI     REAL                       REFS       290   DEFINED        51
    0 DLCF     REAL            CUSR       REFS        11   DEFINED       377
    1 DLCR     REAL            CUSR       REFS        11   DEFINED       383
    3 DLO      REAL            DRNBLK2    REFS        16       932   DEFINED       920
    1 DRAIN    REAL            DRNBLK     REFS        15       315       919   DEFINED       310       313
    0 DRNCST   REAL            DRNBLK     REFS        15
    2 DSC      REAL            COND       REFS         9     2*913   DEFINED       380
  471 DSCRPT   REAL     ARRAY  RL2        REFS        37   DEFINED       888
    3 DT       REAL            DOBK       REFS        13   DEFINED       413
    2 DT2Q     REAL            DOBK       REFS        13
    2 EARTHWK  REAL            RL1        REFS        36   DEFINED       254       257
 4715 EATIT    REAL     ARRAY             REFS         4       257       313   DEFINED        51
    0 EMATCH   REAL            SCAN2      REFS        47       257       263       271       278       279       283
                                           284       285       286       290       291       292       296       297
                                           298       302       303       313       399       417       418       419
                                           437       486       487       524       525       529       530       534
                                           535       536       574       575       576       607       680       681
                                           688       689       692       693       700       735       770       771
                                           793
    0 ENTITY   REAL     ARRAY  SCAN2      REFS        41        47       165       172       184       202       207
                                           231       316       335       352       363       421       451       456
                                           463       470       476       482       502       507       512       541
                                           549       557       567       584       588       590       614       629
                                           639       643       645       685       686       687       691       701
                                           707       736       742       760       761       775       803       843
                                           856
    2 EPO      REAL            DRNBLK2    REFS        16       932   DEFINED       920
    1 ESC      REAL            COND       REFS         9     2*913   DEFINED       328
   26 FAC      REAL            LCY        REFS        20
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          PROGRAM PACKET     74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE    19
VARIABLES        SN  TYPE               RELOCATION
     6 FACTOR    REAL                 RL1        REFS        36   DEFINED       625
     1 FACTR1    REAL                 PRVNT      REFS        27   DEFINED       149       774
     2 FACTR2    REAL                 PRVNT      REFS        27   DEFINED       154       428
     3 FACTR3    REAL                 PRVNT      REFS        27   DEFINED       156       819
     1 FDE       REAL                 BSBLK      REFS         8   DEFINED       424
    10 FILCSTO   REAL                 DRNBLK2    REFS        16       932   DEFINED       920
  3621 FLEX      REAL                            REFS       298       303       576   DEFINED        55
  4420 FLEXVAL   INTEGER                         REFS         3       406       408       410   DEFINED       405       407
                                                  408
     4 FRSTSL    REAL                 PRVNT      REFS        27
     3 GRM       INTEGER              BSBLK      REFS         3         8       488   DEFINED       485       486       487
  4644 GLIST     REAL        ARRAY               REFS         4       897   DEFINED        85
  4475 HHOND     REAL        ARRAY               REFS         4       263   DEFINED        55
  3630 HCALC     REAL                            REFS       418       680   DEFINED        55
  3615 HCF       REAL                            REFS       286   DEFINED        54
  3627 HDRY      REAL                            REFS       279   DEFINED        55
  4500 HFPM      REAL        ARRAY               REFS         4       437   DEFINED        55
  3612 HGC       REAL                            REFS       283   DEFINED        54
     0 HH        REAL        ARRAY    HBLK       REFS        19   DEFINED       802       805       807
  3613 HIF       REAL                            REFS       284   DEFINED        54
  4504 HLIST     REAL        ARRAY               REFS         4       888   DEFINED        65        80
  3617 HNO       REAL                            REFS       417       525       530       534   DEFINED        55
  3624 HNONE     REAL                            REFS       296       574   DEFINED        55
  3626 HNORM     REAL                            REFS       278   DEFINED        55
  3631 HREAD     REAL                            REFS       419       681   DEFINED        55
  3622 HSAG      REAL                            REFS       487   DEFINED        55
  3614 HSS       REAL                            REFS       285   DEFINED        54
     5 H30       REAL                 DRNBLK2    REFS        16       932   DEFINED       920
  4422 I         INTEGER                         REFS       172       180       183       198       202       206       227
                                                  230     2*257       263       266       271       274     2*313       340
                                                  350       351       361       362       370       372       395       399
                                                  402       410       437       440       442       445       448       499
                                                  502       507       511       520     2*541       545     2*557       561
                                                2*567       570       583       587       591       593       607       610
                                                  638       642       646       648       711       713       730       746
                                                  754     2*760       765       793       796       854       855       861
                                                2*862       867       880       882       901       905       906       907
                                              DEFINED       172       179       197       202       226       256       262
                                                  270       312       333       349       350       360       361       394
                                                  398       409       436       490       519       540       544       556
                                                  560       566       582       593       606       621       637       648
                                                  675       704       729       739       759       764       792       836
                                                  852       854       878
  3633 IAVAL     INTEGER                         REFS       177   DEFINED        55
     1 IBN       INTEGER              AMBLK      REFS         7   DEFINED       261       266
     0 IBTE      INTEGER              BSBLK      REFS         8       916       917       918   DEFINED       269       274
                                                  916       917       918
  3634 IBVAL     INTEGER                         REFS       178   DEFINED        55
     0 IC        INTEGER              COND       REFS         9       287   DEFINED       282       283       284       285
                                                  286
     0 ICYCLE    INTEGER              PRVNT      REFS        27   DEFINED       150       777
     0 ID        INTEGER              DOBK       REFS        13       293       620   DEFINED       289       290       291
                                                  292
     2 IDF       INTEGER              RODLOD     REFS        39       407   DEFINED       406
     0 IDGWTO    INTEGER              DRNBLK2    REFS        16       932   DEFINED       920
     1 IDIPO     INTEGER              DRNBLK2    REFS        16       932   DEFINED       319       920
     0 IDR       INTEGER              RODLOD     REFS        39       391   DEFINED       390
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VARIABLES     SN  TYPE              RELOCATION
     2  IDRY      INTEGER           SUBK           REFS        44       280   DEFINED       277       278       279
     0  IFCON     INTEGER           FCON           REFS        18   DEFINED       533       534       535
  4425  IFD       INTEGER                          REFS       426       916       917       918   DEFINED       416       417
                                                    418       420
    70  IFL       INTEGER           PRVNT          REFS        27   DEFINED       162       646
  4423  ILOC      INTEGER                          REFS     3*190       191       194       195     2*213       214       217
                                                    218       219       220       221     2*237       238       239       242
                                                    243     2*248     2*433     2*666   DEFINED       183       206       230
     0  IMAN      INTEGER           RDSTR          REFS        31
   620  IMIX      INTEGER           MIXBLK         REFS        24       351       362       395       658       758       760
                                                    765       855   DEFINED       758
    30  IO        INTEGER           SCAN2          REFS        41  I/O REFS       144       172       195       202       221
                                                    243       248       342       372       433       456       476       482
                                                    666       717       811       862       870
     0  IREST     INTEGER           RESTR          REFS        32       299   DEFINED       295       296       297       298
    33  IRG       INTEGER           PRVNT          REFS        27   DEFINED       161       591
     0  ISKIP     INTEGER           PRVNT1         REFS        30       526   DEFINED       523       524       525
  4433  ISKP      INTEGER                          REFS       905       906       907       908   DEFINED       879       905
                                                    906       907
     1  ITY       INTEGER           DOBK           REFS        13       304   DEFINED       301       302       303
     1  IUBC      INTEGER           SUBK           REFS        44       690       694   DEFINED       684       688       689
                                                    692       693
    26  IVALUE    INTEGER           SCAN2          REFS        47       170       189       212       236       319       332
                                                    333       334       339       342       357       368       390       392
                                                    393       395       423       461       468       551       586       594
                                                    616       620       621       622       631       641       649       704
                                                    711       739       744       777       805       835       836       837
                                                    845       855   DEFINED       318       331       389       391       392
                                                    393       460       619       703       709       738       834       853
     2  IVM       INTEGER           PRVNT1         REFS        30   DEFINED       728
  4427  I1        INTEGER                          REFS       497       510       883       890       904
                                                DEFINED       496       509       882
  4430  I2        INTEGER                          REFS       502       507     2*888     2*894     2*897       899
                                                DEFINED       497       500       505       887       893       896       898
  4432  I3        INTEGER                          REFS       884       885       888       908   DEFINED       876       885
                                                    902       908
  4436  I4        INTEGER                          REFS       891       897   DEFINED       890
  4434  I5        INTEGER                          REFS       892       894       902   DEFINED       884
  4424  J         INTEGER                          REFS       340       456       476       482       498       499       501
                                                    502     2*504       506       507       508       509       511       710
                                                    711       713       745       746       754       878       901
                                                DEFINED       334       456       476       482       491       498       501
                                                    506       510       622       676       705       710       740       745
                                                    837       877
    37  JCYCLE    INTEGER           PRVNT          REFS        27   DEFINED       148       616
     0  JDL       INTEGER           SCAN3          REFS        43       392       394       408       409       861       862
                                                DEFINED       386       867
     1  JISKIP    INTEGER           PRVNT1         REFS        30   DEFINED       669
     0  JMAN      INTEGER           MANLK          REFS        23       531   DEFINED       528       529       530
     1  JREST     INTEGER           RESTR          REFS        32       577   DEFINED       573       574       575       576
    26  JXX       INTEGER   ARRAY   MANLK          REFS        23   DEFINED       711
  4426  K         INTEGER                          REFS       494       671     2*674       675       676       880       888
                                                    889       904   DEFINED       492       670       674       874       904
  4435  K2        INTEGER                          REFS       894       897       899       900   DEFINED       889       900
     1  K4        INTEGER           RL1            REFS        36
     0  K7        INTEGER           RL1            REFS        36   DEFINED       520
     6  LENGTHO   INTEGER           DRNBLK2        REFS        16       932   DEFINED       920
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         PROGRAM PACKET     74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420       09/02/77  13.54.00      PAGE   21

VARIABLES   SN  TYPE              RELOCATION
    1 LFUNC     INTEGER             TYPBK         REFS       46  DEFINED      402      796
    0 LMH       INTEGER             TYPBK         REFS       46  DEFINED      604      610
   15 LOUTO     INTEGER             DRNBLK2       REFS       16      932  DEFINED      920
   27 LS        INTEGER             LCY           REFS       20      841      842  DEFINED      840      841
    1 LZ        INTEGER             RODLOD        REFS       39  DEFINED      761
    0 MATCH     INTEGER             SCAN2         REFS       47      177      178      180      198      227      671
    1 MLYST     INTEGER             MANLK         REFS       23      715      717  DEFINED      655
    0 MNT       INTEGER             DOM           REFS       14
   25 MODE      INTEGER             SCAN2         REFS       41      165      166      170      172      184      185
                                                   188      194      207      208      211      217      218      219
                                                   220      231      232      235      242      253      309      316
                                                   317      335      336      339      352      353      356      363
                                                   364      367      421      422      451      452      453      463
                                                   464      465      470      471      474      512      513      516
                                                   549      550      584      585      588      589    2*590      591
                                                   592      594      603      614      615      629      630      639
                                                   640      643      644    2*645      646      647      649      687
                                                   691      701      702      707      708      721      724      736
                                                   737      742      743      748      751      775      776      803
                                                   804      809      843      844      847      856      857      860
    0 MXN       INTEGER             AMBLK         REFS        7
  243 NB        INTEGER             LYTD          REFS       21      462      620      675      729      877    2*907
                                               DEFINED      462
   27 NCHAR     INTEGER             SCAN2         REFS       41      165      169      184      200      207      231
                                                   316      335      352      363      421      451      454      463
                                                   470      475      481      493      512      538      549      554
                                                   564      584      588      590      614      629      639      643
                                                   645      687      691      701      707      736      742      757
                                                   775      803      843      856
   51 NCOM      INTEGER             LYTD          REFS       21      332      445      621      675      729      836
                                                   877    2*905      906      907
  166 NERR      INTEGER             SCAN2         REFS       41      171      201      224      345      371      455
                                                   478      480      716      810      870      912
                                               DEFINED      143      171      201      224      345      371      455
                                                   478      480      716      810
   43 NFL       INTEGER             PRVNT         REFS       27  DEFINED      158      551
    1 NFLEX     INTEGER             TYP           REFS       45
  163 NLIST     INTEGER             SCAN2         REFS       41      179      197      226
    0 NNAT      INTEGER             LYTD          REFS       21      442
   36 NOACFT    INTEGER    ARRAY    RLMN          REFS       35  DEFINED      395      410      855
    5 NOD       INTEGER             NBLK          REFS       26
    0 NOG       INTEGER             NBLK          REFS       26
    1 NOH       INTEGER             NBLK          REFS       26
    2 NOO       INTEGER    ARRAY    RDSTR         REFS       31  DEFINED      754
    6 NOSG      INTEGER             NBLK          REFS       26
   14 NOUTO     INTEGER             DRNBLK2       REFS       16      932  DEFINED      920
    1 NP        INTEGER             SCAN3         REFS       43      772  DEFINED      146      769      770      771
    2 NPT       INTEGER             NBLK          REFS       26
   24 NR        INTEGER             SCAN2         REFS       41    2*462      469  DEFINED      461
    6 NRG       INTEGER             PRVNT         REFS       27  DEFINED      160      631
    0 NRIGID    INTEGER             TYP           REFS       45      682  DEFINED      679      680      681
  145 NSBB      INTEGER             LYTD          REFS       21      448      621      675      729      835      877
                                                 2*906      907
 4431 NSGY      INTEGER                           REFS      706      715      717  DEFINED      699      706
    1 NUMS      INTEGER             RDSTR         REFS       31      741  DEFINED      734      741
 4421 NW        INTEGER                           REFS      172      202      456      476      482      495      496
                                                   500      504      505      539      540      542      543      544
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          PROGRAM PACKET      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00        PAGE      22

 VARIABLES     SN  TYPE              RELOCATION
                                                         555       556       558       559       560       565       566       568
                                                         569       759       762       763       764   DEFINED       169       200
                                                         454       475       481       493       504       538       539       543
                                                         554       555       559       564       565       569       757       763
      3  NX        INTEGER                 NBLK         REFS        26
      4  NY        INTEGER                 NBLK         REFS        26
      2  NYOO      INTEGER     ARRAY       MANLK        REFS        23   DEFINED       713
      0  OMTF      REAL                    MTO          REFS        25   DEFINED       634
      1  OMTR      REAL                    MTO          REFS        25   DEFINED       652
      4  PERMO     REAL                    DRNBLK2      REFS        16       932   DEFINED       920
     11  PIPCSTO   REAL                    DRNBLK2      REFS        16       932   DEFINED       920
     35  PTCH      REAL                    PRVNT        REFS        27   DEFINED       155       579
   4443  RDLD1     INTEGER     ARRAY                    REFS         3       391   DEFINED        48
   4455  RDLD2     INTEGER     ARRAY                    REFS         3       407   DEFINED        48
     44  REPFL     REAL        ARRAY       PRVNT        REFS         6        27   DEFINED       638       642
      7  REPRG     REAL        ARRAY       PRVNT        REFS         6        27   DEFINED       583       587
   3620  RIGI      REAL                                 REFS       297       302       575   DEFINED        55
   4437  RLIST     INTEGER     ARRAY                    REFS         3         4       671   DEFINED        55
     13  RNO       REAL                    DRNBLK2      REFS        16       932   DEFINED       920
   3632  SCHE      REAL                                 REFS       700   DEFINED        55
     71  SCLPOP    REAL                    PRVNT        REFS        27   DEFINED       163       799
    164  SION      REAL                    SCAN2        REFS        41       685
    165  SIVE      REAL                    SCAN2        REFS        41       686
     41  SLCT      REAL                    PRVNT        REFS        27   DEFINED       153       696
     12  SLO       REAL                    DRNBLK2      REFS        16       932   DEFINED       920
      0  STORE1    REAL        ARRAY       MIXBLK       REFS        24   DEFINED       362
    144  STORE2    REAL        ARRAY       MIXBLK       REFS        24   DEFINED       351
   3625  STRA      REAL                                 REFS       735   DEFINED        55
      0  SUBD      REAL                    SUBK         REFS        44   DEFINED       828
   4707  TA        REAL        ARRAY                    REFS         4       248       399       433       666       793
                                                     DEFINED        51
   4704  TC        REAL        ARRAY                    REFS         4       607   DEFINED        51
     14  TCY       REAL        ARRAY       SCAN3        REFS        43
     12  TM        REAL        ARRAY       HBLK         REFS        19   DEFINED       842
      2  TRL       REAL        ARRAY       SCAN3        REFS        43   DEFINED       658
      0  TRST      REAL                    DMBLK        REFS        12   DEFINED       913
      2  TRY       REAL        ARRAY       LCY          REFS        20
   3605  UNCH      REAL                                 REFS       771   DEFINED        51
     26  VALUE     REAL                    SCAN2        REFS        41        47       165       172       184       207       231
                                                         254       306       310       316       318       322       325       328
                                                         331       335       351       352       362       363       377       380
                                                         383       386       389       405       413       421       424       428
                                                         451       460       463       469       470       512       548       549
                                                         579       583       584       587       588       590       604       613
                                                         614       619       625       628       629       634       638       639
                                                         642       643       645       652       655       658       661       687
                                                         691       696       701       703       707       709       736       738
                                                         742       746       774       775       799       802       803       807
                                                         819       822       825       828       831       834       842       843
                                                         853       856   DEFINED       170       189       212       236       339
                                                         357       368       423       468       586       594       641       649
                                                         744       845
   3623  WGCM      REAL                                 REFS       486   DEFINED        55
      1  WOS       REAL                    SA           REFS        40   DEFINED       822
     30  XCBR      REAL                    LCY          REFS        20   DEFINED       825
      7  XK        REAL                    NBLK         REFS        26   DEFINED       831
    147  XMT       REAL        ARRAY       LYTD         REFS        21       448
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          PROGRAM PACKET     74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE    23

VARIABLES     SN  TYPE           RELOCATION
   31  XSTR      REAL                LCY          REFS        20   DEFINED     325
    1  YCBR      REAL       ARRAY    LYTD         REFS        21      442
 3616  YES       REAL                             REFS       529      535   DEFINED      55
    1  YK        REAL                LCY          REFS        20
   52  ZCBR      REAL       ARRAY    LYTD         REFS        21      445
  244  ZMT       REAL       ARRAY    LYTD         REFS        21   DEFINED     469

FILE NAMES        MODE
       TAPE12    FMT                   WRITES      924       932       942      READS       920      MOTION      923
       TAPE2                           MOTION      914       915
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS          TYPE   ARGS       REFERENCES
       CKDATA              0           947
       CTABLE              2           340       597       600       730       780       783       786       789
       PARSE               4           165       184       207       231       316       335       352       363       421
                                       451       463       470       512       549       584       588       590       614
                                       629       639       643       645       687       691       701       707       736
                                       742       775       803       843       856
       PLABAY              3           442       445       448
       RDLINE              0           167       186       209       233       337       354       365       458       466
                                       472       514       589       644       722       725       749       752       816
                                       848       858

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       FLOAT     REAL       1  INTRIN            313

STATEMENT LABELS             DEF LINE   REFERENCES
  561  1                       253       214
  602  2                       261       214
  621  3                       269       214
  640  4                       277       214
  655  5                       282       214
  702  6                       289       214
  723  7                       295       214
  744  8                       301       214
 3272  9                       874       214
  761  10                      306       214
  765  11                      309       214
 1024  12                      322       214
 1030  14                      325       214
 1034  15                      328       214
 1040  16                      331       214
 1104  17                      349       214
 1135  18                      360       214
 1176  19                      377       214
 1202  20                      380       214
 1206  21                      383       214
 1212  22                      386       214
 1217  23                      389       214
 1250  24                      398       214
 1265  25                      405       214
 1312  27                      413       214
 1316  29                      416       214
 1353  30                      428       214
   55  42                      165       168       175       205       255       259       267       275       280       287
                                         293       299       304       307       311       315       320       323       326
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            PROGRAM PACKET     74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    24

STATEMENT LABELS            DEF LINE   REFERENCES
                                      329      346      378      381      384      387      396      403      411
                                      414      425    2*426      429      488      526      531      536      542
                                      546      552      558      562      568      571      577      580      605
                                      611      617      626      632      635      653      656      659      662
                                      682      690      694      697      762      766      772      778      797
                                      800      806      808      820      823      826      829      832
    60  43                     166    196      225      244      251      341      370      375      434      439
                                      521      592      598      601      647      667      715      720      731
                                      735      748      781      784      787      790      815      847      861
                                      868
    77  44                     167    166
   102  46                     169  6*166      550      585      615      630      640      776
   123  50                     177  2*166
     0  55                     199    197
   263  56                     200    182      229      265      273    2*280    2*287    2*293    2*299    2*304
                                      317      401      422      426    2*488    2*526    2*531    2*536    2*577
                                      609      673    2*682    2*690    2*694    2*772      795
   300  60                     206    198
     0  62         INACTIVE    212    211
   314  63                     211    208
   326  64                     214    217      218      219      220
   322  65                     213    211
   372  66                     217    211
   416  68                     221    213
  3530  77                     947    919
     0  87                     395    394
     0  88                     410    409
  2242  90                     606    603
     0  94                     608    606
  2253  95                     610    607
   552  99                     248  3*214
  1366 101                     436    239      443      446      449      457      474      483
  1557 103                     485    239
  1574 104                     490    239
  1732 105                     523    239
  1747 106                     528    239
  1764 108                     533    239
  2001 109                     538    239
  2033 110                     548    239
  2046 111                     554    239
  2100 112                     564    239
  2127 113                     573    239
  2150 114                     579    239
  2154 115                     582    239
  2223 116                     597    239
  2227 117                     600    239
  2233 118                     603    239
  2257 120                     613    239
  2272 121                     619    239
  2313 122                     625    239
  2317 123                     628    239
  2332 124                     634    239
  2336 125                     637    239
  2405 126                     652    239
  2411 127                     655    239
  2416 129                     658    239
  2422 130                     661    239
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           PROGRAM PACKET      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00         PAGE     25
STATEMENT LABELS                    DEF LINE    REFERENCES
      0  146                           760         759
      0  150                           765         764
   3231  159                           854         860
   3240  160                           856         859
   3251  164                           860         857
   3225  165                           853         860
      0  167         INACTIVE          861         860
   1357  199                           433        4*239
   2435  201                           669         191
   2465  203                           679         191
   2502  204                           684         191
   2546  205                           696         191
   2552  207                           699         191
   2650  208                           728         191
   2661  209                           734         191
   2746  210                           757         191
   3006  211                           769         191
   3023  212                           774         191
   3036  213                           780         191
   3042  214                           783         191
   3046  215                           786         191
   3052  216                           789         191
   3056  217                           792         191
   3073  218                           799         191
   3077  219                           802         191
   3132  220                           819         191
   3136  221                           822         191
   3142  222                           825         191
   3146  223                           828         191
   3152  224                           831         191
   3156  226                           834         191
   3174  227                           840         191
   3223  229                           852         191
      0  291         INACTIVE          423         422
   1344  292                           424         422
      0  293                           400         398
   1261  294                           402         399
   2426  299                           666        5*191
      0  302                           264         262
      0  303                           272         270
    615  304                           266         263
    634  305                           274         271
   2554  306                           700         714
   2624  307                           715         700        721
      0  308         INACTIVE          703         702
   2570  309                           704         702
   2577  310                           707         712        726
      0  311         INACTIVE          709         708
   2610  312                           710         708
   2620  313                           713         724
   2634  314                           721         702
   2557  315                           701         723
   2642  316                           724         708
   2512  317                           687         685
   2530  318                           691         686
   2663  321                           735         755
   2666  322                           736         750
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          PROGRAM PACKET      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE    26

STATEMENT LABELS                      DEF LINE    REFERENCES
    0  323           INACTIVE            738          737
 2677  324                               739          737
 2706  325                               742          747         753
    0  326           INACTIVE            744          743
 2716  327                               745          743
 2726  329                               748          737
 2734  330                               751          743
 2742  331                               754          751
 3176  333                               841          844         846
    0  334           INACTIVE            845          844
 3215  335                               847          844
 3204  336                               843          849
 3102  339                               803          817
    0  340           INACTIVE            805          804
 3113  341                               807          804
 3117  342                               809          804
 3127  343                               816          809
    0  345                               438          436
 1377  346                               440          437
 1411  351                               442          440
 1415  352                               445          440
 1421  353                               448          440
 1425  354                               451          440         459
 1461  355                               461          452
 1455  356                               460          452
    0  357           INACTIVE            453          452
 1452  358                               458          453
 1470  359                               463          467
 1504  360                               468          464
 1507  361                               469          464
    0  362           INACTIVE            465          464
 1512  363                               470          473         479
 1523  364                               474          471
 1542  367                               480          465
 1137  370                               361          367         369
 1146  371                               363          366
 1157  372                               367          364
    0  373           INACTIVE            368          367
 1166  374                               370          356         367
 1106  376                               350          356         358
 1115  377                               352          355
 1126  378                               356          353
    0  379           INACTIVE            357          356
  567  382                               256          253
    0  383                               258          256
  773  384                               312          309
    0  385                               314          312
 1020  386                               319          317
    0  387           INACTIVE            318          317
 1350  388                               426          419
 1076  394                               342          332         620         835
 1055  396                               335          338         623         677         838
 1066  397                               339          336
    0  398                               672          670
 2450  399                               674          671
    0  402                               888          887
    0  404                               894          893
```

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            PROGRAM PACKET      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE    27

STATEMENT LABELS                 DEF LINE    REFERENCES
 3371  406                          896        891        892
    0  408                          897        896
    0  410                          899        898
 3412  412                          900        890        895
    0  414                          909        878
 3427  416                          905        883
 3457  418                          911        901
    0  420                          567        566
    0  422          INACTIVE        570
    0  424                          541        540
    0  426                          545        544
    0  428                          557        556
    0  430                          561        560
    0  434                          499        497
 1631  435                          500        495
    0  436                          502        500
 1645  438                          504        494
    0  440                          507        505
    0  442                          511        510
 1702  444                          512        503        508        515
 1713  446                          516        513
    0  448                          517        492
    0  449                          518        490
 1726  450                          520        516
    0  455                          181        179
  143  460                          183        180
  146  461                          184        187
    0  462          INACTIVE        189        188
  157  463                          188        185
  173  464                          191        194
  165  465                          190        188
  237  466                          194        188
  244  468                          195        190
  253  475                          197        177
  427  480                          226        178
    0  481                          228        226
  440  482                          230        227
  443  483                          231        234
  454  484                          235        232
    0  485          INACTIVE        236        235
  462  486                          237        235
  472  487                          239        237        242
  536  488                          242        235
  543  489                          243        238
    0  504                          794        792
 3067  505                          796        793
  303  625                          207        210
 2156  812                          583        595
    0  813          INACTIVE        586        585
 2170  814                          587        585
 2340  821                          638        650
    0  822          INACTIVE        641        640
 2352  823                          642        640
 3265  888                          870        912
 3650  900     FMT                  173        172
 3667  901     FMT                  203        202        456        482
 3640  902     FMT                  145        144
```

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        PROGRAM PACKET     74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE    28

 STATEMENT LABELS                 DEF LINE   REFERENCES
   4104  903      FMT                 863         862
   4042  904      FMT                 718         717
   3705  905      FMT                 222         195        221        243
   4056  906      FMT                 812         811
   4014  909      FMT                 477         476
   4137  910      FMT                 871         870
   3766  911      FMT                 373         372
   3745  912      FMT                 343         342
   3727  918      FMT                 249         248        433        666
   4205  9050     FMT                 925         924
   4252  9051     FMT                 934         932
   4340  9052     FMT                 943         942
   4172  9999     FMT                 922         920

 LOOPS  LABEL      INDEX      FROM-TO     LENGTH     PROPERTIES
   133  455      * I         179 181        6B       INSTACK    EXITS
   254  55       * I         197 199        6B       INSTACK    EXITS
   430  481      * I         226 228        6B       INSTACK    EXITS
   570  383        I         256 258       10B          OPT
   605  302      * I         262 264        6B       INSTACK    EXITS
   624  303      * I         270 272        6B       INSTACK    EXITS
   774  385        I         312 314       10B          OPT
  1240  87         I         394 395        6B       INSTACK
  1251  293      * I         398 400        6B       INSTACK    EXITS
  1303  88         I         409 410        5B       INSTACK
  1367  345      * I         436 438        6B       INSTACK    EXITS
  1575  449      * I         490 518      126B                EXT REFS     EXITS    NOT INNER
  1601  448      * K         492 517      117B                EXT REFS     EXITS    NOT INNER
  1617  434        I2        497 499       11B          OPT
  1632  436        I2        500 502       11B          OPT
  1652  440        I2        505 507       11B          OPT
  1673  442        J         510 511        6B       INSTACK
  2011  424        I         540 541        5B       INSTACK
  2025  426        I         544 545        4B       INSTACK
  2055  428        I         556 557        5B       INSTACK
  2072  430        I         560 561        4B       INSTACK
  2110  420        I         566 567        5B       INSTACK
  2243  94       * I         606 608        6B       INSTACK    EXITS
  2440  398      * K         670 672        6B       INSTACK    EXITS
  2755  146        I         759 760        6B       INSTACK
  2776  150        I         764 765        6B       INSTACK
  3057  504      * I         792 794        6B       INSTACK    EXITS
  3305  414      * I         878 909      151B                  EXITS   NOT INNER
  3332  402        I2        887 888       10B          OPT
  3346  412      * I4        890 900       50B                NOT INNER
  3357  404        I2        893 894       10B          OPT
  3372  408        I2        896 897        7B       INSTACK
  3403  410        I2        898 899        6B       INSTACK

 COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
        AMBLK         2                0 MXN     (1)                1 IBN    (1)
        BSBLK         4                0 IBTE    (1)                1 FDE    (1)                2 BTE     (1)
                                       3 GBM     (1)
        COND          3                0 IC      (1)                1 ESC    (1)                2 DSC     (1)
        CSTBK      1000                0 CCCST   (1000)
        CUSR          2                0 DLCF    (1)                1 DLCR   (1)
        DMBLK         1                0 TRST    (1)
```

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          PROGRAM PACKET      74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420          09/02/77  13.54.00        PAGE    29

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
       DOBK           4               0 ID       (1)           1 ITY      (1)           2 DT2Q     (1)
                                      3 DT       (1)
       DOM            1               0 MNT      (1)
       DRNBLK         2               0 DRNCST   (1)           1 DRAIN    (1)
       DRNBLK2       14               0 IDGWTO   (1)           1 IDIPO    (1)           2 EPO      (1)
                                      3 DLO      (1)           4 PERMO    (1)           5 H30      (1)
                                      6 LENGTHO(1)             7 CAVCSTO(1)             8 FILCSTO(1)
                                      9 PIPCSTO(1)            10 SLO      (1)          11 RNO      (1)
                                     12 NOUTO    (1)          13 LOUTO    (1)
       FCON           1               0 IFCON    (1)
       HBLK          30               0 HH       (10)         10 TM       (20)
       LCY           26               0 AXK      (1)           1 YK       (1)           2 TRY      (20)
                                     22 FAC      (1)          23 LS       (1)          24 XCBR     (1)
                                     25 XSTR     (1)
       LYTD         176               0 NNAT     (1)           1 YCBR     (40)         41 NCOM     (1)
                                     42 ZCBR     (60)        102 NSBB     (1)         103 XMT      (60)
                                    163 NB       (1)         164 ZMT      (12)
       MANLK        422               0 JMAN     (1)           1 MLYST    (1)           2 NYOO     (20)
                                     22 JXX      (400)
       MIXBLK       401               0 STORE1 (100)         100 STORE2 (100)         200 COVRGD (200)
                                    400 IMIX     (1)
       MTO            2               0 OMTF     (1)           1 OMTR     (1)
       NBLK           8               0 NOG      (1)           1 NOH      (1)           2 NPT      (1)
                                      3 NX       (1)           4 NY       (1)           5 NOO      (1)
                                      6 NOSG     (1)           7 XK       (1)
       PRVNT         58               0 ICYCLE (1)             1 FACTR1 (1)             2 FACTR2 (1)
                                      3 FACTR3 (1)             4 FRSTSL (1)             5 COSTR    (1)
                                      6 NRG      (1)           7 REPRG    (20)         27 IRG      (1)
                                     28 CRSL     (1)          29 PTCH     (1)          30 CLNDRN (1)
                                     31 JCYCLE (1)            32 CLNSWP (1)            33 SLCT     (1)
                                     34 COSTF    (1)          35 NFL      (1)          36 REPFL    (20)
                                     56 IFL      (1)          57 SCLPOP (1)
       PRVNT1         3               0 ISKIP    (1)           1 JISKIP (1)             2 IVM      (1)
       RDSTR         72               0 IMAN     (1)           1 NUMS     (1)           2 NOO      (10)
                                     12 CSTRT    (60)
       RESTR          2               0 IREST    (1)           1 JREST    (1)
       RLMN         530               0 ATYPE    (30)         30 NOACFT (500)
       RL1            7               0 K7       (1)           1 K4       (1)           2 EARTHWK(1)
                                      3 ADENT    (3)           6 FACTOR (1)
       RL2          813               0 AAME     (5)           5 AOCATE (8)            13 ADSCRP (300)
                                    313 DSCHPT (150)         463 CHAR     (350)
       RODLOD         3               0 IDR      (1)           1 LZ       (1)           2 IDF      (1)
       SA             2               0 ALOS     (1)           1 WOS      (1)
       SCAN2        119               0 ENTITY (20)           20 NR       (1)          21 MODE     (1)
                                     22 VALUE    (1)          23 NCHAR    (1)          24 IO       (1)
                                     25 ALIST    (30)         55 BLIST    (30)         85 CLIST    (30)
                                    115 NLIST    (1)         116 SION     (1)         117 SIVE     (1)
                                    118 NERR     (1)
       SCAN3         62               0 JDL      (1)           1 NP       (1)           2 TRL      (10)
                                     12 TCY      (50)
       SUBK           3               0 SUBD     (1)           1 IUBC     (1)           2 IDRY     (1)
       TYP            2               0 NRIGID (1)             1 NFLEX    (1)
       TYPBK          2               0 LMH      (1)           1 LFUNC    (1)

  EQUIV CLASSES    LENGTH     MEMBERS - BIAS NAME(LENGTH)
ENTITY  ENTITY         20               0 EMATCH (1)             0 MATCH    (1)
ENTITY  VALUE           1               0 IVALUE (1)
```

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          PROGRAM PACKET     74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE    30

     STATISTICS
       PROGRAM LENGTH               4725B     2517
       CM LABELED COMMON LENGTH     7301B     3777
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BLOCK DATA MDATA       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     1

                     BLOCK DATA MDATA                                                      00005455
            C        *****   START SCAN PACKAGE  ****************************************
                     LOGICAL IPRINT                                                        00005460
                     COMMON/PARS/BUFR(15).COL.ILABEL.INUNIT.IOUT.IPRINT.                   00005461
                    1          ITAH(64).JSTART(72).JUMP.LIMIT.LIST(10).                    00005462
                    2          MARK.MARKW.NENT.ON.PSTATE.SKIP.NFIL                         00005463
                     COMMON /SCAN2/  ENTITY(20).NR.          MODE.VALUE.NCHAR.IA.ALIST
                    1 (30).BLIST(30).CLIST(30).NLIST.SION.SIVE.NERR
                     DATA COL/0/.ILABEL/0/.INUNIT/1/.IOUT/8/.IPRINT/.TRUE./.               0000 464
                    1     ITAB/10*0.22.                                                    00005465
                    1          23.20.21.19.27.5.4*0.                                       00005466
                    1       5*0.2.29.7.4.14.                                               00005467
                    1       31.32.8*0.                                                     00005468
                    1       0.9.10.3.11.12.28.0.15.0.                                      00005469
                    1       7*0.16.17.33.                                                  00005470
                    1       25.30.26/                                                      00005471
                     DATA    JUMP/1/.LIMIT/10/.MARK/72/.MARKW/12/.NENT/0/.
                    1        ON/6HON    /.PSTATE/0/.SKIP/1/.NFIL/0/.                       00005473
                    2  ENTITY/20*1H /
                     DATA IA /9/.
                    A     SION/4HSION/.SIVE/4HSIVE/.NLIST/ 30 /.
                    1  ALIST / 4HEART.4HBOND.4HBT  .4HCLIM.4HCOND.4HCT  .4HDR  .4HDTYP.
                    2   4HEND .4HCFP .4HDRAI.4HCSFP.4H    .4HCFS .4HER  .4HCS  .4HCSOA.
                    3  4HCSOG.4HDCFO.4HDISC.4HDCRO.4HDL  .4HDIR .4HCOR .4HDIF .4H    .
                    4  4HDTHI.4H    .4HFD  .4HCSR /
                     DATA BLIST  /   4HFPMP.4H    .4HGBM .4HGD  .4HMCA .4HGMC .4H    .
                    1  4HIF  .4HIN  .4HOMFP.4HLOB .4HNOR .4HOR  .4HPFP .4HORR .4HFO  .
                    2   4HFP  .4HLC  .4H    .4HMD  .4HFPB .4HGF  .4HOMR .4HMTFO.4HORFP.
                    3  4HMTRO.4HNOSS.4H    .4HPT  .4HLOS /.
                    4     CLIST  /   4HRM  .4H    .4HRSA .4HSCI .4HSTFP.4H    .4HST  .
                    5  4HVM  .4HTOO .4HVT  .4HWAND.4HSJCR.4HROPB.4HROU .4HRP  .4HRPB .
                    6  4HTA  .4HRSPR.4HROT .4HRSR .4HWOS .4HSC  .4HSD  .4HSM  .4H    .
                    7  4HSUBB.4HTIME.4H    .4HYT  .4H    /
                     END                                                                   00005474


      SYMBOLIC REFERENCE MAP (R=3)

  VARIABLES      SN  TYPE           RELOCATION
      31  ALIST      REAL      ARRAY   SCAN2       REFS         7    DEFINED       20
      67  BLIST      REAL      ARRAY   SCAN2       REFS         7    DEFINED       26
       0  BUFR       REAL      ARRAY   PARS        REFS         4
     125  CLIST      REAL      ARRAY   SCAN2       REFS         7    DEFINED       26
      17  COL        REAL              PARS        REFS         4    DEFINED        9
       0  ENTITY     REAL      ARRAY   SCAN2       REFS         7    DEFINED       17
      30  IA         INTEGER           SCAN2       REFS         7    DEFINED       20
      20  ILABEL     INTEGER           PARS        REFS         4    DEFINED        9
      21  INUNIT     INTEGER           PARS        REFS         4    DEFINED        9
      22  IOUT       INTEGER           PARS        REFS         4    DEFINED        9
      23  IPRINT     LOGICAL           PARS        REFS         3         4    DEFINED        9
      24  ITAB       INTEGER   ARRAY   PARS        REFS         4    DEFINED        9
     124  JSTART     INTEGER   ARRAY   PARS        REFS         4
     234  JUMP       INTEGER           PARS        REFS         4    DEFINED       17
     235  LIMIT      INTEGER           PARS        REFS         4    DEFINED       17
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          BLOCK DATA MDATA        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00         PAGE      2

VARIABLES       SN  TYPE              RELOCATION
   236  LIST        INTEGER     ARRAY      PARS          REFS          4
   250  MARK        INTEGER                PARS          REFS          4    DEFINED        17
   251  MARKW       INTEGER                PARS          REFS          4    DEFINED        17
    25  MODE        INTEGER                SCAN2         REFS          7
    27  NCHAR       INTEGER                SCAN2         REFS          7
   252  NENT        INTEGER                PARS          REFS          4    DEFINED        17
   166  NERR        INTEGER                SCAN2         REFS          7
   256  NFIL        INTEGER                PARS          REFS          4    DEFINED        17
   163  NLIST       INTEGER                SCAN2         REFS          7    DEFINED        20
    24  NR          INTEGER                SCAN2         REFS          7
   253  ON          REAL                   PARS          REFS          4    DEFINED        17
   254  PSTATE      REAL                   PARS          REFS          4    DEFINED        17
   164  SION        REAL                   SCAN2         REFS          7    DEFINED        20
   165  SIVE        REAL                   SCAN2         REFS          7    DEFINED        20
   255  SKIP        REAL                   PARS          REFS          4    DEFINED        17
    26  VALUE       REAL                   SCAN2         REFS          7

COMMON BLOCKS     LENGTH      MEMBERS - BIAS NAME(LENGTH)
        PARS         175                  0 BUFR    (15)                 15 COL     (1)                   16 ILABEL (1)
                                         17 INUNIT  (1)                  18 IOUT    (1)                   19 IPRINT (1)
                                         20 ITAB    (64)                 84 JSTART  (72)                 156 JUMP   (1)
                                        157 LIMIT   (1)                 158 LIST    (10)                 168 MARK   (1)
                                        169 MARKW   (1)                 170 NENT    (1)                  171 ON     (1)
                                        172 PSTATE  (1)                 173 SKIP    (1)                  174 NFIL   (1)
        SCAN2        119                  0 ENTITY  (20)                 20 NR      (1)                   21 MODE   (1)
                                         22 VALUE   (1)                  23 NCHAR   (1)                   24 IA     (1)
                                         25 ALIST   (30)                 55 BLIST   (30)                  85 CLIST  (30)
                                        115 NLIST   (1)                 116 SION    (1)                  117 SIVE   (1)
                                        118 NERR    (1)

STATISTICS
  PROGRAM LENGTH                    0B       0
  CM LABELED COMMON LENGTH        4468     294
```

```
      SUBROUTINE CKDATA
      DIMENSION ICHECK(30).JCHECK(30),KCHECK(30)
      DIMENSION IP5(10),P8(10)
      DIMENSION N9(4).RLIST(4)
      INTEGER GBM
      INTEGER ALIST.BLIST.CLIST
      LOGICAL LLISTA(30).LLISTB(30).LLISTC(30),LG1
      COMMON /AMHLK/ MXN,IBN
      COMMON /ARBK/ AREA
      COMMON/BSBLK/IBTE.FDE.BTE.GBM
      COMMON /CSTBK/ CCCST(50.10.2)
      COMMON /CUSR/ DLCF.DLCR
      COMMON /DOBK/ IO.ITY,DT2Q.DT
      COMMON /DOM/ MNT
      COMMON /FCON/ IFCON
      COMMON /HBLK/ HH(10).TM(20),AHH(10)
      COMMON /KAYBK/ IAXK
      COMMON /LCY/ AXK,YK,TRY(20).FAC.LS.XCBR.XSTR
      COMMON /LYTD/ NNAT.YCBR(10.4).NCOM,ZCBR(10.6),NSBB.XMT(10.6).
     1NB.ZMT(3.4)
      COMMON /MANLK/ JMAN.MLYST.NYOO(20).JXX(20.20)
      COMMON/MIXBLK/STORE1(10.10).STORE2(10.10),COVRGD(10.20),IMIX.LR.JJ
      COMMON/MXBLK/IGINT.ICBR
      COMMON/NBLK/ NOG,NOH.NPT.NX.NY,NOD,NOSG,XK
      COMMON /PRVNT1/ ISKIP.JISKIP
      COMMON /RDSTR/ IMAN.NUMS.NOO(10).CSTRT(10,6)
      COMMON /RESTR/ IREST.JREST.ICOUNT
      COMMON /RLMN/ JTYPE(3.10).NOACFT(50.10)
      COMMON /RL1/ K7.K4.EARTHWK.IDENT(3).FACTOR
      COMMON /RODLOD/ IDR.LZ.IDF
      COMMON /SA/ALOS.WOS
      COMMON /SCAN2/  ENTITY(20).NR.          MODE.VALUE.NCHAR.IO.ALIST
     1 (30).BLIST(30).CLIST(30).NLIST
      COMMON /SCAN3/ JDL.NP.TRL(10).TCY(50)
      COMMON /SUBK/ SUBD.IUBC.IDRY
      COMMON /TYP/ NRIGID.NFLEX
      COMMON /TYPBK/ LMH.LFUNC
      DATA RLIST /3HRIC.3HROS.3HFIC.3HFOS/
      DATA (ICHECK(I).I=1.30) /1.4*-1.2,-1.3.2*-1.4,-1.5.6.2*-1.7.8.
     13*-1.9.3*-1.10.11.-1.12.-1/
      DATA (JCHECK(I).I=1.30) /2*-1.1,-1.2,10*-1.3.4.5.2*-1.6.5*-1.7.
     13*-1/
      DATA (KCHECK(I).I=1.30) /1.-1.2.3,2*-1.4.-1.5.-1.6.-1.7,8,9,10.
     111.-1.12.-1.13.14,15.16.2*-1.17.18.19.-1/
      DATA (LLISTA(I).I=1.30).(LLISTB(J).J=1.30).(LLISTC(K).K=1.30)
     1/90*.F./
 1000 FORMAT (2X.20I2)
 2000 FORMAT (2X.12F6.2)
 2500 FORMAT(2X.A4.5X.12HMUST BE READ)
 3500 FORMAT(/1X.18HREQUIRED VARIABLES//)
 4500 FORMAT(1X.10H THERE ARE.1X.I2.1X.19H ERRORS OF OMISSION)
 5500 FORMAT(3X.A4.2X.A3.13H MUST BE READ)
 6000 FORMAT(2X.20(2X.I2))
      IF(ID.EQ.1) IREST=1+ITY
      IF((JREST.EQ.3).A.(IREST.EQ.3)) NRIGID=0
      IF((JREST.EQ.2).A.(IREST.EQ.2)) NFLEX=0
      IF((JREST.EQ.3).O.((IREST.EQ.2).A.(JREST.EQ.2))) IAXK=2
      AREA=(ALOS*WOS)/9.0
      IF(NRIGID.NE.0) LLISTC(3)=.T.
      LLISTA(6)=.T.
      LLISTB(18)=.T.
      LLISTC(11)=.T.
      LLISTC(21)=.T.
      LLISTC(17)=.T.
      LLISTC(29)=.T.
      LLISTA(22)=.T.
      LLISTC(27)=.T.
      IF(ID.EQ.3) GO TO 401
      IF(JISKIP.EQ.1) LLISTC(1)=.T.
      IF(JISKIP.EQ.1) GO TO 401
      LLISTB(5)=.T.
  401 IF(ID.NE.1) GO TO 402
      LLISTA(8)=.T.
      LLISTA(27)=.T.
  402 IF((ID.EQ.1).A.(IREST.EQ.2)) GO TO 403
      LLISTB(17)=.T.
      LLISTC(4)=.T.
      LLISTB(21)=.T.
  403 IF((ID.EQ.1).A.(IAXK.EQ.1)) LLISTC(15)=.T.
      IF((ID.NE.1).A.((IAXK.EQ.1).O.(IREST.NE.3))) LLISTC(15)=.T.
      IF((ID.NE.1).A.(IREST.NE.3)) LLISTC(16)=.T.
  404 IF((ID.NE.3).A.(JREST.NE.2)) LLISTB(16)=.T.
      IF(NRIGID.EQ.2) LLISTA(18)=.T.
      IF(NRIGID.EQ.0) GO TO 405
      LLISTA(14)=.T.
      LLISTC(19)=.T.
      LLISTC(24)=.T.
  405 IF(NFLEX.EQ.0) GO TO 406
      LLISTC(22)=.T.
      IF(ID.NE.1) LLISTC(23)=.T.
  406 LG1=NRIGID.EQ.2
      IF(LG1.A.(IAXK.EQ.1)) LLISTA(17)=.T.
      IF(IBTE.NE.1) LLISTB(3)=.T.
      IF(JMAN.NE.1) LLISTC(7)=.T.
      IF(ID.EQ.3) GO TO 407
      IF(IMAN.EQ.2) LLISTC(9)=.T.
      IF((JREST.NE.3).A.(IBN.NE.2)) LLISTC(13)=.T.
      IF((JREST.NE.3).A.(IBN.NE.1)) LLISTC(14)=.T.
  407 CONTINUE
      IF((IBTE.EQ.4).O.(IBTE.EQ.2)) LLISTA(29)=.T.
      N10=0
      DO 100 I=1,30
      IF(LLISTA(I)) GO TO 99
      GO TO 100
   99 JINDEX=ICHECK(I)
      GO TO (101,106,108,111,113,114,117,118,122,100,127,129),JINDEX
  101 IF(JTYPE(1,1).EQ.4H    ) GO TO 190
      GO TO 100
  106 IF(ID.GT.1000000) GO TO 190
      GO TO 100
  108 IF(ITY.GT.1000000) GO TO 190
      GO TO 100
C     THE FOLLOWING IS INOPERATIVE-AIRCRAFT.MAINTENANCE DEFAULTS TO ZERO
  111 N1=NCOM+NSBB+NB+10
```

```
      N2=INT(CCCST(N1,1,1)+.1)
      IF(N2.EQ.0) GO TO 190
      GO TO 100
113   IF(HTE.GT.1000000) GO TO 190
      GO TO 100
114   IF(XSTR.GT.1000000.) GO TO 190
      GO TO 100
117   N3=0
      DO 98 J=1,IMIX
      DO 98 K=1,10
      IF(STORE2(J,K).GT.1000000.) N3=N3+1
98    CONTINUE
      IF(N3.GT.0) GO TO 190
      GO TO 100
118   N3=0
      DO 97 J=1,IMIX
      DO 97 K=1,10
      IF(STORE1(J,K).GT.1000000.) N3=N3+1
97    CONTINUE
      IF(N3.GT.0) GO TO 190
      GO TO 100
122   IF(JDL.GT.1000000) GO TO 190
      GO TO 100
127   IF(DT.GT.1000000.) GO TO 190
      GO TO 100
129   IF(FDE.LT.2.) GO TO 190
      GO TO 100
190   WRITE(IO,2500) ALIST(I)
      N10=N10+1
100   CONTINUE
      DO 200 I=1,30
      IF(LLISTB(I)) GO TO 199
      GO TO 200
199   JINDEX=JCHECK(I)
      GO TO (203,205,216,217,218,221,227),JINDEX
203   IF(GHM.GT.1000000) GO TO 290
      GO TO 200
205   IF(ISKIP.LT.2) GO TO 290
      GO TO 200
216   N3=INT(CCCST(7,1,1)+.1)
      IF(N3.EQ.0) GO TO 290
      GO TO 200
217   N3=INT(CCCST(3,1,1)+.1)
      IF(N3.EQ.0) GO TO 290
      GO TO 200
218   IF(JTYPE(1,1).NE.4HROAD)GO TO 230
      LMH=1
      GO TO 200
230   IF(LMH.GT.1000000)GO TO 290
      GO TO 200
221   N3=NCOM+NSBB+NB+7
      N4=INT(CCCST(N3,1,1)+.1)
      IF(N4.EQ.0) GO TO 290
      GO TO 200
227   IF(MLYST.GT.1000000) GO TO 290
      GO TO 200
290   WRITE(IO,2500) BLIST(I)
```

```
      N10=N10+1
 200  CONTINUE
      DO 300 I=1,30
      IF(LLISTC(I)) GO TO 299
      GO TO 300
  299 JINDEX=KCHECK(I)
      GO TO (301,303,304,307,309,311,313,314,315,316,317,319,321,322
     1,323,324,327,328,329),JINDEX
  301 N3=NCOM+NS88+N8+8
      N4=N3+4
      N8=0
      DO 334 N5=N3,N4
      N7=N5
      IF(N5.GT.N3+1) N7=N5-1
      IF(N5.EQ.N3+2) GO TO 334
      N6=INT(CCCST(N5,1,1)+.1)
      N9(N7-N3+1)=0
      IF(N6.GT.0) N9(N7-N3+1)=1
      IF(N6.GT.0) N8=1
  334 CONTINUE
      IF(N8.EQ.0) GO TO 390
      IF((N9(1).EQ.0).A.(IREST.NE.3)) WRITE(IO,5500) CLIST(I),RLIST(1)
      IF((N9(2).EQ.0).A.(JREST.NE.3)) WRITE(IO,5500) CLIST(I),RLIST(2)
      IF((N9(3).EQ.0).A.(IREST.NE.2)) WRITE(IO,5500) CLIST(I),RLIST(3)
      IF((N9(4).EQ.0).A.(JREST.NE.2)) WRITE(IO,5500) CLIST(I),RLIST(4)
      GO TO 300
 303  IF(NRIGID.GT.1000000) NRIGIO=1
      GO TO 300
 304  IF(IUHC.GT.1000000) GO TO 390
      GO TO 300
 307  LG1=MLYST.LT.1000000
      N6=10000000
      N5=10000000
      IF(LG1) N5=NYOD(MLYST)
      IF(LG1.A.N5.LT.1000000) N6=JXX(MLYST,N5)
      IF((N5.GT.1000000).O.(N6.GT.1000000)) GO TO 390
      GO TO 300
 309  IF(NUMS.EQ.0) GO TO 390
      GO TO 300
 311  GO TO 300
 313  N7=INT(CCCST(5,1,1)+.1)
      IF(N7.EQ.0) GO TO 390
      GO TO 300
 314  N7=INT(CCCST(6,1,1)+.1)
      IF(N7.EQ.0) GO TO 390
      GO TO 300
 315  N7=INT(CCCST(1,1,1)+.1)
      IF(N7.EQ.0) GO TO 390
      GO TO 300
 316  N7=INT(CCCST(2,1,1)+.1)
      IF(N7.EQ.0) GO TO 390
      GO TO 300
 317  IF(LFUNC.GT.1000000) GO TO 390
      GO TO 300
 319  IF(JTYPE(1,1).NE.4HROAD)GO TO 340
      DO 355 IHA=1,10
 355  HH(IHA)=1.
```

```
      GO TO 300
  340 IF((HH(1).GT.1000000).OR.(HH(10).GT.1000000))GO TO 390
      IF(HH(1).LT.HH(10))GO TO 345
      REVRSE=HH(1)
      HH(1)=HH(10)
      HH(10)=REVRSE
  345 XNOH=10.
      NOH=XNOH+.0001
      DO 10 M=2.NOH
      X=M-1
      HH(M)=HH(1)+(HH(NOH)-HH(1))*X/(XNOH-1.)
   10 CONTINUE
      GO TO 300
  321 IF(AREA.GT.100000000.) GO TO 390
      GO TO 300
  322 IF(XCRR.GT.1000000.) GO TO 390
      GO TO 300
  323 IF(SUBD.GT.1000000.) GO TO 390
      GO TO 300
  324 IF(XK.GT.1000000.) GO TO 390
      GO TO 300
  327 IF(TM(2).LT.1000000.) GO TO 300
      IF(JDL.GT.1000000) GO TO 390
      TM(6)=FLOAT(JDL)
      TM(2)=AINT(FLOAT(JDL)/5.+.0001)
      TM(3)=2.*TM(2)
      TM(4)=3.*TM(2)
      TM(5)=2.*TM(3)
      GO TO 300
  328 IF(TOL.GT.1000000.) GO TO 390
      GO TO 300
  329 IF(LZ.EQ.3)GO TO 300
      LG1=JDL.GT.1000000.O.IMIX.EQ.0
      IF(LG1) GO TO 390
      N8=0
      DO 298 J=1.JDL
      DO 298 JMIX=1.IMIX
      IF(NOACFT(J.JMIX).GT.0) N8=1
  298 CONTINUE
      IF(N8.EQ.0) GO TO 390
      GO TO 300
  390 WRITE(IO.2500) CLIST(I)
      N10=N10+1
  300 CONTINUE
      IF(N10.EQ.0) GO TO 170
      WRITE(IO.3500)
      WRITE(IO.4500) N10
      STOP 1031
  170 WRITE(6.6000) ITY
      WRITE(6.2000) DT
      WRITE(6.6000) GHM
      WRITE(6.2000) FDE
      WRITE(6.1000) IAXK.IBTE
      WRITE(6.6000) IFCON
      WRITE(6.6000) MXN.IBN
      IBN=IBN+1
      WRITE(6.2000) SUBD
      WRITE(6,6000) JREST
      WRITE(5,6000) JMAN
      WRITE(6,6000) MLYST
      IF(JMAN.EQ.1) GO TO 60
      WRITE(6,6000) (NYOO(I),I=1,MLYST)
      DO 61 I=1,MLYST
      NOOO=NYOO(I)
      DO 61 J=1,NOOO
      WRITE(6,6000) JXX(I,J)
 61   CONTINUE
 60   CONTINUE
      WRITE(6,2000)  DLCF,DLCR
      WRITE(6,6000) IREST
      IF(ID.EQ.3) GO TO 51
      IF(NUMS.LE.2) GO TO 660
      IP4=0
      IP12=0
      IP11=NUMS-1
      DO 600 I=1,IP11
      IF(IP4.GT.0) IP4=IP4-1
      IF(IP4.GT.0) GO TO 600
      IP1=INT(CSTRT(I,1)+.1)
      IF(IP1.EQ.0) GO TO 600
      IP2=I+1
      IP4=0
      DO 610 J=IP2,NUMS
      IP3=INT(CSTRT(J,1)+.1)
      IF(IP3.NE.IP1) GO TO 610
      IP4=IP4+1
      IP12=IP12+1
      IP5(IP4)=J
610   CONTINUE
      IF(IP4.EQ.0) GO TO 600
      DO 630 L=1,IP4
      IP6=IP2+L-1
      IP7=NOO(IP6)
      DO 620 K=1,IP7
      P8(K)=CSTRT(IP6,K)
620   CONTINUE
      IP9=NOO(IP5(L))
      IP10=IP5(L)
      NOO(IP6)=IP9
      DO 650 K=1,IP9
      CSTRT(IP6,K)=CSTRT(IP10,K)
650   CONTINUE
      NOO(IP10)=IP7
      DO 640 K=1,IP7
      CSTRT(IP10,K)=P8(K)
640   CONTINUE
630   CONTINUE
600   CONTINUE
      K4=IP12
660   IF(NUMS.GT.2) GO TO 670
      IP1=INT(CSTRT(1,1)+.1)
      IP2=INT(CSTRT(NUMS,1)+.1)
      IF(IP1.EQ.IP2) K4=1
      IF(IP1.NE.IP2) K4=2
```

```
         670  CONTINUE
              WRITE(6,6000) NUMS
              WRITE(6,6000) (NOO(I),I=1,NUMS)
              DO 52 I=1,NUMS
              NUMO=NOO(I)
              DO 52 J=1,NUMO
              WRITE(6,2000) CSTRT(I,J)
          52  CONTINUE
          51  CONTINUE
              WRITE(6,6000) NNAT,NCOM,NSBB,NB
              NOFSG=1
              ICCSIZ=NCOM+NSBB+NB+12
              DO 333 I=1,ICCSIZ
              NOPTS=INT(CCCST(I,1,1)+.1)+2
              CCCST(I,1,2)=FLOAT(NOFSG)
              NOFSG=NOFSG+NOPTS-2
              WRITE(6,2000) ((CCCST(I,J,K),K=1,2),J=1,NOPTS)
         333  CONTINUE
              IF(NNAT.EQ.0) GO TO 34
              WRITE(6,2000) ((YCBR(I,J),I=1,NNAT),J=1,4)
          34  CONTINUE
              IF(NCOM.EQ.0) GO TO 291
              WRITE(6,2000) ((ZCBR(I,J),I=1,NCOM),J=1,4)
         291  CONTINUE
              IF(NSBB.EQ.0) GO TO 36
              WRITE(6,2000) ((XMT(I,J),I=1,NSBB),J=1,4)
          36  CONTINUE
              WRITE(6,2000) (ZMT(I,1),I=1,NB)
              WRITE(6,6000) IUBC,IDRY
              WRITE(6,2000) (TM(I),I=1,LS)
              WRITE(6,2000) (HH(I),I=1,NOH)
              IF(ID.NE.1) GO TO 400
              DO 399 I=1,NUMS
              NUMO=NOO(I)
              DO 398 K=1,NUMO
              J=NUMO-K+1
              IF(NUMO.EQ.0) GO TO 399
              CSTRT(I,J+1)=CSTRT(I,J)
         398  CONTINUE
              CSTRT(I,1)=0.
              NOO(I)=NUMO+1
         399  CONTINUE
         400  CONTINUE
              RETURN
              END
```

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        SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE      REFERENCES
     2  CKDATA          1            386
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        SUBROUTINE CKDATA      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/09/77  10.58.39          PAGE      8

VARIABLES        SN  TYPE               RELOCATION
      36  AHH         REAL        ARRAY    HBLK           REFS          16
      31  ALIST       INTEGER     ARRAY    SCAN2          REFS           6        32        142
       0  ALOS        REAL                 SA             REFS          31        58
       0  AREA        REAL                 ARBK           REFS           9       242    DEFINED        58
       0  AXK         REAL                 LCY            REFS          18
      67  BLIST       INTEGER     ARRAY    SCAN2          REFS           6        32        171
       2  BTE         REAL                 BSBLK          REFS          10       118
       0  CCCST       REAL        ARRAY    CSTBK          REFS          11       115        154       157       166       187       212
                                                           215          218       221        356       359    DEFINED      357
     125  CLIST       INTEGER     ARRAY    SCAN2          REFS           6        32        193       194       195       196       270
     310  COVRGD      REAL        ARRAY    MIXBLK         REFS          22
      14  CSTRT       REAL        ARRAY    RDSTR          REFS          26       307        312       323       329       339       340
                                                           349          380    DEFINED       329       333       380       382
       0  DLCF        REAL                 CUSR           REFS          12       297
       1  DLCR        REAL                 CUSR           REFS          12       297
       3  DT          REAL                 DOBK           REFS          13       138        278
       2  DT2Q        REAL                 DOBK           REFS          13
       2  EARTHWK     REAL                 RL1            REFS          29
       0  ENTITY      REAL        ARRAY    SCAN2          REFS          32
      26  FAC         REAL                 LCY            REFS          18
       6  FACTOR      REAL                 RL1            REFS          29
       1  FDE         REAL                 BSBLK          REFS          10       140        280
       3  GBM         INTEGER              BSBLK          REFS           5        10        150       279
       0  HH          REAL        ARRAY    HBLK           REFS          16     2*230      2*231       232       233     3*239       373
                                                       DEFINED         228       233        234       239
    2376  I           INTEGER                             REFS         103       105        142       146       148       171       175
                                                           177          193       194        195       196       270       290       292
                                                           294          307       309        345       347       349       356       357
                                                           359          362       365        368       370       372       373       376
                                                         2*380          382       383    DEFINED       102       145       174       290
                                                           291          304       345        346       355       362       365       368
                                                           370          372       373        375
       0  IAXK        INTEGER              KAYBK          REFS          17        79         80        92       281
                                                       DEFINED          57
       1  IBN         INTEGER              AMBLK          REFS           8        97         98       283       284
                                                       DEFINED         284
       0  IBTE        INTEGER              BSBLK          REFS          10        93      2*100       281
       1  ICBR        INTEGER              MXBLK          REFS          23
    2437  ICCSIZ      INTEGER                             REFS         355    DEFINED        354
    2441  ICHECK      INTEGER     ARRAY                   REFS           2       105    DEFINED        39
       2  ICOUNT      INTEGER              RESTR          REFS          27
       0  ID          INTEGER              DOBK           REFS          13        54         68        72        75        79        80
                                                            81           82        90         95       109       299       374
       3  IDENT       INTEGER     ARRAY    RL1            REFS          29
       2  IDF         INTEGER              RODLOD         REFS          30
       0  IDR         INTEGER              RODLOD         REFS          30
       2  IDRY        INTEGER              SUBK           REFS          35       371
       0  IFCON       INTEGER              FCON           REFS          15       282
       0  IGINT       INTEGER              MXBLK          REFS          23
    2412  IHA         INTEGER                             REFS         228    DEFINED        227
       0  IMAN        INTEGER              RDSTR          REFS          26        96
     620  IMIX        INTEGER              MIXBLK         REFS          22       123        130       261       265
      30  IO          INTEGER              SCAN2          REFS          32   I/O REFS       142       171       193       194       195
                                                           196          270       274        275
    2425  IP1         INTEGER                             REFS         308       313        341       342    DEFINED      307       339
    2434  IP10        INTEGER                             REFS         329       331        333    DEFINED      326
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       SUBROUTINE CKDATA      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/09/77  10.58.39       PAGE     9

VARIABLES      SN   TYPE              RELOCATION
  2424  IP11      INTEGER                          REFS      304  DEFINED      303
  2423  IP12      INTEGER                          REFS      315      337  DEFINED      302      315
  2426  IP2       INTEGER                          REFS      311      320      341      342  DEFINED      309      340
  2427  IP3       INTEGER                          REFS      313  DEFINED      312
  2422  IP4       INTEGER                          REFS    2*305      306      314      316      318      319
                                                DEFINED      301      305      310      314
  2573  IP5       INTEGER    ARRAY                 REFS        3      325      326  DEFINED      316
  2431  IP6       INTEGER                          REFS      321      323      327      329  DEFINED      320
  2432  IP7       INTEGER                          REFS      322      331      332  DEFINED      321
  2433  IP9       INTEGER                          REFS      327      328  DEFINED      325
     0  IREST     INTEGER             RESTR        REFS       27       55       56       57       75       80       81
                                                    193      195      298  DEFINED       54
     0  ISKIP     INTEGER             PRVNT1       REFS       25      152
     1  ITY       INTEGER             DOBK         REFS       13       54      111      277
     1  IUBC      INTEGER             SUBK         REFS       35      200      371
  2403  J         INTEGER                          REFS      125      132      266      294      312      316      349
                                                    359      362      365      368    2*380  DEFINED      123      130
                                                    264      293      311      348      359      362      365      368
                                                    378
  2477  JCHECK    INTEGER    ARRAY                 REFS        2      148  DEFINED       41
     0  JDL       INTEGER             SCAN3        REFS       34      136      251      252      253      261      264
  2377  JINDEX    INTEGER                          REFS      106      149      178  DEFINED      105      148      177
     1  JISKIP    INTEGER             PRVNT1       REFS       25       69       70
   622  JJ        INTEGER             MIXBLK       REFS       22
     0  JMAN      INTEGER             MANLK        REFS       21       94      287      289
  2420  JMIX      INTEGER                          REFS      266  DEFINED      265
     1  JREST     INTEGER             RESTR        REFS       27       55       56     2*57       82       97       98
                                                    194      196      286
     0  JTYPE     INTEGER    ARRAY    RLMN         REFS       28      107      160      226
    26  JXX       INTEGER    ARRAY    MANLK        REFS       21      206      294
  2404  K         INTEGER                          REFS      125      132    2*323    2*329    2*333      359      378
                                                DEFINED      124      131      322      328      332      359      377
  2535  KCHECK    INTEGER    ARRAY                 REFS        2      177  DEFINED       43
     1  K4        INTEGER             RL1          REFS       29  DEFINED      337      341      342
     0  K7        INTEGER             RL1          REFS       29
  2430  L         INTEGER                          REFS      320      325      326  DEFINED      319
     1  LFUNC     INTEGER             TYPBK        REFS       37      224
  2374  LG1       LOGICAL                          REFS        7       92      205      206      262
                                                DEFINED       91      202      261
  2627  LLISTA    LOGICAL    ARRAY                 REFS        7      103  DEFINED       45       60       66       73
                                                     74       83       85       92      100
  2665  LLISTB    LOGICAL    ARRAY                 REFS        7      146  DEFINED       45       61       71       76
                                                     78       82       93
  2723  LLISTC    LOGICAL    ARRAY                 REFS        7      175  DEFINED       45       59       62       63
                                                     64       65       67       69       77       79       80       81
                                                     86       87       89       90       94       96       97       98
     0  LMH       INTEGER             TYPBK        REFS       37      163  DEFINED      161
   621  LR        INTEGER             MIXBLK       REFS       22
    27  LS        INTEGER             LCY          REFS       18      372
     1  LZ        INTEGER             RODLOD       REFS       30      260
  2415  M         INTEGER                          REFS      238      239  DEFINED      237
     1  MLYST     INTEGER             MANLK        REFS       21      169      202      205      206      288      290
                                                    291
     0  MNT       INTEGER             DOM          REFS       14
    25  MODE      INTEGER             SCAN2        REFS       32
     0  MXN       INTEGER             AMBLK        REFS        8      283
   243  NB        INTEGER             LYTD         REFS       19      114      165      180      352      354      370
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          SUBROUTINE CKDATA      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/09/77  10.58.39        PAGE     10

VARIABLES     SN   TYPE                 RELOCATION
      27  NCHAR       INTEGER               SCAN2        REFS      32
      51  NCOM        INTEGER               LYTD         REFS      19     114     165     180     352     354     364
                                                          365
       1  NFLEX       INTEGER               TYP          REFS      36      88 DEFINED      56
     163  NLIST       INTEGER               SCAN2        REFS      32
       0  NNAT        INTEGER               LYTD         REFS      19     352     361     362
      36  NOACFT      INTEGER     ARRAY     RLMN         REFS      28     266
       5  NOD         INTEGER               NBLK         REFS      24
    2436  NOFSG       INTEGER                            REFS     357     358 DEFINED     353     358
       0  NOG         INTEGER               NBLK         REFS      24
       1  NOH         INTEGER               NBLK         REFS      24     237     239     373 DEFINED     236
       2  NOO         INTEGER     ARRAY     RDSTR        REFS      26     321     325     345     347     376
                                                      DEFINED     327     331     383
    2421  NOOO        INTEGER                            REFS     293 DEFINED     292
    2440  NOPTS       INTEGER                            REFS     358     359 DEFINED     356
       6  NOSG        INTEGER               NBLK         REFS      24
       1  NP          INTEGER               SCAN3        REFS      34
       2  NPT         INTEGER               NBLK         REFS      24
      24  NR          INTEGER               SCAN2        REFS      32
       0  NRIGID      INTEGER               TYP          REFS      36      59      83      84      91     198
                                                      DEFINED      55     198
     146  NSBB        INTEGER               LYTD         REFS      19     114     165     180     352     354     367
                                                          368
    2435  NUMO        INTEGER                            REFS     348     377     378     379     383
                                                      DEFINED     347     376
       1  NUMS        INTEGER               RDSTR        REFS      26     209     300     303     311     338     340
                                                          344     345     346     375
       3  NX          INTEGER               NBLK         REFS      24
       4  NY          INTEGER               NBLK         REFS      24
       2  NYOO        INTEGER     ARRAY     MANLK        REFS      21     205     290     292
    2400  N1          INTEGER                            REFS     115 DEFINED     114
    2375  N10         INTEGER                            REFS     143     172     271     273     275
                                                      DEFINED     101     143     172     271
    2401  N2          INTEGER                            REFS     116 DEFINED     115
    2402  N3          INTEGER                            REFS     125     127     132     134     155     158     166
                                                          181     183     185     186     188     189
                                                      DEFINED     122     125     129     132     154     157     165
                                                          180
    2405  N4          INTEGER                            REFS     167     183 DEFINED     166     181
    2407  N5          INTEGER                            REFS     184   2*185     186     187   2*206     207
                                                      DEFINED     183     204     205
    2411  N6          INTEGER                            REFS     189     190     207 DEFINED     187     203     206
    2410  N7          INTEGER                            REFS     188     189     213     216     219     222
                                                      DEFINED     184     185     212     215     218     221
    2406  N8          INTEGER                            REFS     192     268 DEFINED     182     190     263     266
    2617  N9          INTEGER     ARRAY                  REFS       4     193     194     195     196
                                                      DEFINED     188     189
    2605  P8          REAL        ARRAY                  REFS       3     333 DEFINED     323
    2413  REVRSE      REAL                               REFS     234 DEFINED     232
    2623  PLIST       REAL        ARRAY                  REFS       4     193     194     195     196
                                                      DEFINED      38
       0  STORE1      REAL        ARRAY     MIXBLK       REFS      22     132
     144  STORE2      REAL        ARRAY     MIXBLK       REFS      22     125
       0  SUBD        REAL                  SUBK         REFS      35     246     285
      14  TCY         REAL        ARRAY     SCAN3        REFS      34
      12  TM          REAL        ARRAY     HBLK         REFS      16     250     254     255     256     372
                                                      DEFINED     252     253     254     255     256
      SUBROUTINE CKDATA     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/09/77  10.58.39        PAGE    11

VARIABLES       SN  TYPE            RELOCATION
  2417  TOL      *  REAL      *UNDEF                  REFS        258
     2  TRL         REAL      ARRAY     SCAN3         REFS         34
     2  TRY         REAL      ARRAY     LCY           REFS         18
    26  VALUE       REAL                SCAN2         REFS         32
     1  WOS         REAL                SA            REFS         31         58
  2416  X           REAL                              REFS        239    DEFINED       238
    30  XCBR        REAL                LCY           REFS         18        244
     7  XK          REAL                NBLK          REFS         24        248
   147  XMT         REAL      ARRAY     LYTD          REFS         19        368
  2414  XNOH        REAL                              REFS        236        239    DEFINED       235
    31  XSTR        REAL                LCY           REFS         18        120
     1  YCBR        REAL      ARRAY     LYTD          REFS         19        362
     1  YK          REAL                LCY           REFS         18
    52  ZCBR        REAL      ARRAY     LYTD          REFS         19        365
   244  ZMT         REAL      ARRAY     LYTD          REFS         19        370

FILE NAMES          MODE
        TAPE6       FMT                      WRITES         277        278        279        280        281        282        283        285
                                                286         287        288        290        294        297        298        344        345
                                                349         352        359        362        365        368        370        371        372
                                                373
        VARIABLES USED AS FILE NAMES, SEE ABOVE

INLINE FUNCTIONS     TYPE     ARGS        DEF LINE   REFERENCES
        AINT        REAL       1  INTRIN             253
        FLOAT       REAL       1  INTRIN             252        253        357
        INT         INTEGER    1  INTRIN             115        154        157        166        187        212        215        218
                                                     221        307        312        339        340        356

STATEMENT LABELS                  DEF LINE    REFERENCES
     0  10                           240        237
  1727  34                           363        361
  1773  36                           369        367
  1632  51                           351        299
     0  52                           350        346        348
  1366  60                           296        289
     0  61                           295        291        293
     0  97                           133        130        131
     0  98                           126        123        124
   256  99                           105        103
   445  100                          144        102        104        106        108        110        112        117        119        121
                                                128        135        137        139        141
   302  101                          107        106
   306  106                          109        106
   313  108                          111        106
   320  111                          114        106
   334  113                          118        106
   340  114                          120        106
   344  117                          122        106
   372  118                          129        106
   420  122                          136        106
   425  127                          138        106
   431  129                          140        106
  1300  170                          277        273
   435  190                          142        107        109        111        116        118        120        127        134        136
                                                138        140
   456  199                          148        146
```

```
         SUBROUTINE CKDATA      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/09/77  10.58.39      PAGE    12

  STATEMENT LABELS                  DEF LINE   REFERENCES
    570  200                           173        145      147       151       153       156       159       162       164       168
                                                   170
    475  203                           150        149
    502  205                           152        149
    506  216                           154        149
    515  217                           157        149
    524  218                           160        149
    537  221                           165        149
    553  227                           169        149
    532  230                           163        160
    560  290                           171        150      152       155       158       163       167       169
   1751  291                           366        364
      0  298                           267        264      265
    601  299                           177        175
   1264  300                           272        174      176       197       199       201       208       210       211       214
                                                   217      220       223       225       229       241       243       245       247
                                                   249      250       257       259       260       269
    634  301                           180        178
    753  303                           198        178
    761  304                           200        178
    766  307                           202        178
   1016  309                           209        178
   1021  311                           211        178
   1023  313                           212        178
   1032  314                           215        178
   1041  315                           218        178
   1050  316                           221        178
   1057  317                           224        178
   1064  319                           226        178
   1142  321                           242        178
   1146  322                           244        178
   1152  323                           246        178
   1156  324                           248        178
   1162  327                           250        178
   1211  328                           258        178
   1215  329                           260        178
      0  333                           360        355
    700  334                           191        183      186
   1076  340                           230        226
   1114  345                           235        231
      0  355                           228        227
   1254  390                           270        192      200       207       209       213       216       219       222       224
                                                   230      242       244       246       248       251       258       262       268
      0  398                           381        377
   2054  399                           384        375      379
   2060  400                           385        374
     73  401                            72         68       70
    102  402                            75         72
    116  403                            79         75
      0  404           INACTIVE         82
    164  405                            88         84
    174  406                            91         88
    240  407                            99         95
   1545  600                           336        304      306       308       318
   1452  610                           317        311      313
      0  620                           324        322
      0  630                           335        319
```

```
       SUBROUTINE CKDATA        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/09/77  10.58.39         PAGE      13

 STATEMENT LABELS                 DEF LINE   REFERENCES
     0  640                          334      332
     0  650                          330      328
  1553  660                          338      300
  1575  670                          343      338
  2061  1000     FMT                  47      281
  2063  2000     FMT                  48      278       280       285       297       349       359       362       365       368
                                              370       372       373
  2065  2500     FMT                  49      142       171       270
  2071  3500     FMT                  50      274
  2075  4500     FMT                  51      275
  2103  5500     FMT                  52      193       194       195       196
  2107  6000     FMT                  53      277       279       282       283       286       287       288       290       294
                                              298       344       345       352       371

 LOOPS  LABEL     INDEX       FROM-TO     LENGTH      PROPERTIES
   252  100     * I          102 144      176B                  EXT REFS  NOT INNER
   347  98      * J          123 126      17B                   NOT INNER
   351  98        K          124 126      12B          OPT
   375  97      * J          130 133      17B                   NOT INNER
   377  97        K          131 133      12B          OPT
   452  200     * I          145 173      121B                  EXT REFS
   575  300     * I          174 272      472B                  EXT REFS  NOT INNER
   647  334       N5         183 191      34B          OPT
  1070  355       IHA        227 228      4B         INSTACK
  1123  10        M          237 240      15B          OPT
  1232  298     * J          264 267      16B                   NOT INNER
  1234  298       JMIX       265 267      11B          OPT
  1343  61      * I          291 295      22B                   EXT REFS  NOT INNER
  1350  61      * J          293 295      12B                   EXT REFS
  1411  600     * I          304 336      137B                  NOT INNER
  1433  610       J          311 317      22B          OPT
  1461  630     * L          319 335      63B                   NOT INNER
  1471  620       K          322 324      10B          OPT
  1514  650       K          328 330      10B          OPT
  1531  640       K          332 334      10B          OPT
  1607  52      * I          346 350      22B                   EXT REFS  NOT INNER
  1614  52      * J          348 350      12B                   EXT REFS
  1644  333     * I          355 360      41B                   EXT REFS  NOT INNER
  1662          * J          359 359      16B                   EXT REFS  NOT INNER
  1663          * K          359 359      12B                   EXT REFS
  1712          * J          362 362      12B                   EXT REFS
  1734          * J          365 365      12B                   EXT REFS
  1756          * J          368 368      12B                   EXT REFS
  2024  399     * I          375 384      33B                   NOT INNER
  2031  398     * K          377 381      15B         .OPT        EXITS

 COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       AMBLK          2               0 MXN     (1)               1 IBN     (1)
       ARBK           1               0 AREA    (1)
       BSBLK          4               0 IBTE    (1)               1 FDE     (1)                         2 BTE     (1)
                                      3 GBM     (1)
       CSTBK       1000               0 CCCST   (1000)
       CUSR           2               0 DLCF    (1)               1 DLCR    (1)
       DOBK           4               0 ID      (1)               1 ITY     (1)                         2 DT2Q    (1)
                                      3 DT      (1)
       DOM            1               0 MNT     (1)
       FCON           1               0 IFCON   (1)
```

```
      SUBROUTINE CKDATA      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420          09/09/77  10.58.39         PAGE    14

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       HBLK         40                    0 HH       (10)              10 TM       (20)              30 AHH      (10)
       KAYBK         1                    0 IAXK     (1)
       LCY          26                    0 AXK      (1)                1 YK       (1)                2 TRY      (20)
                                         22 FAC      (1)               23 LS       (1)               24 XCBR     (1)
                                         25 XSTR     (1)
       LYTD        176                    0 NNAT     (1)                1 YCBR     (40)              41 NCOM     (1)
                                         42 ZCBR     (60)             102 NSBB     (1)              103 XMT      (60)
                                        163 NB       (1)              164 ZMT      (12)
       MANLK       422                    0 JMAN     (1)                1 MLYST    (1)                2 NYOO     (20)
                                         22 JXX      (400)
       MIXBLK      403                    0 STORE1  (100)             100 STORE2  (100)             200 COVRGD  (200)
                                        400 IMIX     (1)              401 LR       (1)              402 JJ       (1)
       MXBLK         2                    0 IGINT    (1)                1 ICBR     (1)
       NBLK          8                    0 NOG      (1)                1 NOH      (1)                2 NPT      (1)
                                          3 NX       (1)                4 NY       (1)                5 NOD      (1)
                                          6 NOSG     (1)                7 XK       (1)
       PRVNT1        2                    0 ISKIP    (1)                1 JISKIP   (1)
       RDSTR        72                    0 IMAN     (1)                1 NUMS     (1)                2 NOO      (10)
                                         12 CSTRT    (60)
       RESTR         3                    0 IREST    (1)                1 JREST    (1)                2 ICOUNT   (1)
       RLMN        530                    0 JTYPE    (30)              30 NOACFT  (500)
       RL1           7                    0 K7       (1)                1 K4       (1)                2 EARTHWK(1)
                                          3 IDENT    (3)                6 FACTOR   (1)
       RODLOD        3                    0 IDR      (1)                1 LZ       (1)                2 IDF      (1)
       SA            2                    0 ALOS     (1)                1 WOS      (1)
       SCAN2       116                    0 ENTITY   (20)              20 NR       (1)               21 MODE     (1)
                                         22 VALUE    (1)               23 NCHAR    (1)               24 IO       (1)
                                         25 ALIST    (30)              55 BLIST    (30)              85 CLIST    (30)
                                        115 NLIST    (1)
       SCAN3        62                    0 JDL      (1)                1 NP       (1)                2 TRL      (10)
                                         12 TCY      (50)
       SUBK          3                    0 SUBD     (1)                1 IUBC     (1)                2 IDRY     (1)
       TYP           2                    0 NRIGID   (1)                1 NFLEX    (1)
       TYPBK         2                    0 LMH      (1)                1 LFUNC    (1)

STATISTICS
  PROGRAM LENGTH                  2763B     1523
  CM LABELED COMMON LENGTH        5521B     2897
```

```
      SUBROUTINE PLABAY(NM,B,NQ)
      DIMENSION B(10,4)
      COMMON /SCAN2/  ENTITY(20),NR,          MODE,VALUE,NCHAR,IO,ALIST
     1 (30),BLIST(30),CLIST(30),NLIST,SION,SIVE,NERR
      EQUIVALENCE (VALUE,IVALUE)
    5 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE - 2) 2,3,4
    4 IF(MODE .EQ. 9) GO TO 6
      J= (NCHAR+3)/4
      WRITE(IO,901) (ENTITY(I),I=1,J)
  901 FORMAT(*0ERROR. THE FOLLOWING DATA IS IMPROPERLY USED*,/,1X,20A4/)
      NERR= NERR +1
      RETURN
    6 CALL RDLINE
      GO TO 5
    3 IVALUE= VALUE + 0.001
    2 NR= IVALUE
      IC= 0
      IF(NR .GT. NQ) NQ= NR
    1 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE - 2) 7,8,9
    7 VALUE= IVALUE
    8 IC= IC+1
      B(NR,IC)= VALUE
      GO TO 1
    9 IF(MODE .LE. 8) GO TO 10
      CALL RDLINE
      GO TO 1
   10 IF(NM.EQ.1 .AND. IC.EQ. 3) GO TO 11
      IF(IC.EQ. 2) GO TO 11
      WRITE(IO,902)
  902 FORMAT(*0ERROR FOUND IN FLEXIBLE.PAVEMENT.PROPERTIES TABLE. PLEASE
     1 CHECK INPUT DATA*)
      NERR=NERR+1
   11 IC= 4
      B(NR,IC)= 0.0
      IF(ENTITY(2) .EQ. SION) GO TO 14
      IF(ENTITY(2) .EQ. SIVE) GO TO 16
   15 IF(B(NR,IC) .EQ. 0.0) RETURN
   12 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(MODE .LT. 9) GO TO 13
      CALL RDLINE
      GO TO 12
   14 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(ENTITY(1).EQ.4HNFS )B(NR,IC)=1
      IF(ENTITY(1).EQ.4HFS  )B(NR,IC)=3
      GO TO 15
   16 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
      IF(ENTITY(1).EQ.4HNFS )B(NR,IC)=2
      IF(ENTITY(1).EQ.4HFS  )B(NR,IC)=4
      GO TO 15
   13 IF(MODE .GT. 2) RETURN
      NERR= NERR+1
      J= (NCHAR+3)/4
      WRITE(IO,904) (ENTITY(I),I=1,J)
  904 FORMAT(*0ERROR.  THE FOLLOWING DATA APPEARS TO BE OUT OF SEQUENCE*
     1)
```

```
       SUBROUTINE PLABAY     74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      2

                       GO TO 12
                       END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    4  PLABAY           1          13        39        52

VARIABLES     SN  TYPE           RELOCATION
   31  ALIST     REAL       ARRAY    SCAN2        REFS         3
    0  B         REAL       ARRAY    F.P.         REFS         2        39   DEFINED         1        24        36        45
                                                    46        49        50
   67  BLIST     REAL       ARRAY    SCAN2        REFS         3
  125  CLIST     REAL       ARRAY    SCAN2        REFS         3
    0  ENTITY    REAL       ARRAY    SCAN2        REFS         3         6        10        20        37        38        40
                                                    44        45        46        48        49        50        55
  312  I         INTEGER                          REFS        10        55   DEFINED        10        55
  313  IC        INTEGER                          REFS        23        24        29        30        36        39        45
                                                    46        49        50   DEFINED        18        23        35
   30  IO        INTEGER             SCAN2        REFS         3  I/O REFS        10        31        55
   26  IVALUE    INTEGER             SCAN2        REFS         5        17        22   DEFINED        16
  311  J         INTEGER                          REFS        10        55   DEFINED         9        54
   25  MODE      INTEGER             SCAN2        REFS         3         6         7         8        20        21        26
                                                    40        41        44        48        52
   27  NCHAR     INTEGER             SCAN2        REFS         3         6         9        20        40        44        48
                                                    54
  166  NERR      INTEGER             SCAN2        REFS         3        12        34        53   DEFINED        12        34
                                                    53
  163  NLIST     INTEGER             SCAN2        REFS         3
    0  NM        INTEGER             F.P.         REFS        29   DEFINED         1
    0  NQ        INTEGER             F.P.         REFS        19   DEFINED         1        19
   24  NR        INTEGER             SCAN2        REFS         3      2*19        24        36        39        45        46
                                                    49        50   DEFINED        17
  164  SION      REAL                SCAN2        REFS         3        37
  165  SIVE      REAL                SCAN2        REFS         3        38
   26  VALUE     REAL                SCAN2        REFS         3         5         6        16        20        24        40
                                                    44        48   DEFINED        22
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS          TYPE   ARGS       REFERENCES
       PARSE                4              6        20        40        44        48
       RDLINE               0             14        27        42

STATEMENT LABELS             DEF LINE   REFERENCES
   54  1                         20        25        28
   43  2                         17         7
   37  3                         16         7
    0  4          INACTIVE        8         7
    7  5                          6        15
   34  6                         14         8
    0  7          INACTIVE       22        21
   64  8                         23        21
   75  9                         26        21
```

```
      SUBROUTINE PLABAY       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00         PAGE     3

  STATEMENT LABELS                 DEF LINE   REFERENCES
     103  10                           29         26
     120  11                           35         29           30
     142  12                           40         43           58
     217  13                           52         41
     153  14                           44         37
     135  15                           39         47           51
     175  16                           48         38
     246  901       FMT                11         10
     260  902       FMT                32         31
     276  904       FMT                56         55

  COMMON BLOCKS   LENGTH        MEMBERS - BIAS NAME(LENGTH)
        SCAN2        119                  0 ENTITY (20)            20 NR     (1)              21 MODE    (1)
                                         22 VALUE  (1)             23 NCHAR  (1)              24 IO      (1)
                                         25 ALIST  (30)            55 BLIST  (30)             85 CLIST   (30)
                                        115 NLIST  (1)            116 SION   (1)             117 SIVE    (1)
                                        118 NERR   (1)

  EQUIV CLASSES   LENGTH        MEMBERS - BIAS NAME(LENGTH)
 ENTITY  VALUE         1                  0 IVALUE (1)

  STATISTICS
    PROGRAM LENGTH                   314B      204
    CM LABELED COMMON LENGTH         167B      119
```

```
SUBROUTINE CTABLE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     1

1               SUBROUTINE CTABLE(I,L)
                COMMON /CSTBK/ CCCST(50,10,2)
                COMMON /RL2/ NAME(5),LOCATE(8),IDSCRPT(30,10),DSCRPT(3,50),CHAR(7,
               150)
5               COMMON /SCAN2/  ENTITY(20),NR,          MODE,VALUE,NCHAR,IO,ALIST
               1 (30),BLIST(30),CLIST(30),NLIST,SION,SIVE,NERR
                EQUIVALENCE (VALUE,IVALUE)
          C
          C     THE VARIABLES I AND L MAY NOT BE REDEFINED IN THIS SUBROUTINE
10        C
                IF(MODE .LT. 3) GO TO 390
                IF(L .GT. 45 .AND. L .NE. 48) GO TO 386
                NW= (NCHAR+3)/4
                DO 387 J=1,NW
15          387 CHAR(J, L)= ENTITY(J)
            386 CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
                IF(MODE - 2) 389,390,388
            388 NERR=NERR + 1
                NW= (NCHAR+3)/4
20              WRITE(IO,901) (ENTITY(I1),I1=1,NW)
            901 FORMAT(72H0THE FOLLOWING NAME IS NOT IN THE SCAN DICTIONARY OR WAS
               1 IMPROPERLY USED  ,/,1X,20A4,/)
                RETURN
            389 VALUE= IVALUE
25          390 DO 393 J=2,10
                DO 392 K=1,2
                CCCST( I,J,K)= VALUE
                CALL PARSE(ENTITY,MODE,VALUE,NCHAR)
                IF(MODE - 2) 391,392,394
30          391 VALUE= IVALUE
            392 CONTINUE
            393 CONTINUE
                J=10
                WRITE(IO,913)
35          913 FORMAT(*0ERROR.  MORE THAN 8 SEGMENTS HAVE BEEN SPECIFIED.*)
            394 CCCST( I,1,1)= J-2
                RETURN
                END


      SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE     REFERENCES
      4  CTABLE          1          23          37

  VARIABLES       SN  TYPE              RELOCATION
     31  ALIST        REAL        ARRAY    SCAN2        REFS          5
     67  BLIST        REAL        ARRAY    SCAN2        REFS          5
      0  CCCST        REAL        ARRAY    CSTBK        REFS          2   DEFINED      27        36
    717  CHAR         REAL        ARRAY    RL2          REFS          3   DEFINED      15
    125  CLIST        REAL        ARRAY    SCAN2        REFS          5
    471  DSCRPT       REAL        ARRAY    RL2          REFS          3
      0  ENTITY       REAL        ARRAY    SCAN2        REFS          5       15        16        20        28
      0  I            INTEGER                 F.P.      REFS         27       36    DEFINED       1
      SUBROUTINE CTAHLE      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00        PAGE     2

VARIABLES       SN  TYPE              RELOCATION
   15  IDSCRPT     INTEGER     ARRAY     RL2          REFS          3
   30  IO          INTEGER               SCAN2        REFS          5    I/O REFS        20          34
   26  IVALUE      INTEGER               SCAN2        REFS          7        24          30
  165  I1          INTEGER                            REFS         20    DEFINED         20
  164  J           INTEGER                            REFS       2*15        27          36    DEFINED        14          25          33
  166  K           INTEGER                            REFS         27    DEFINED         26
    0  L           INTEGER                 F.P.       REFS       2*12        15     DEFINED          1
    5  LOCATE      INTEGER     ARRAY     RL2          REFS          3
   25  MODE        INTEGER               SCAN2        REFS          5        11          16          17          28          29
    0  NAME        INTEGER     ARRAY     RL2          REFS          3
   27  NCHAR       INTEGER               SCAN2        REFS          5        13          16          19          28
  166  NERR        INTEGER               SCAN2        REFS          5        18     DEFINED         18
  163  NLIST       INTEGER               SCAN2        REFS          5
   24  NR          INTEGER               SCAN2        REFS          5
  163  NW          INTEGER                            REFS         14        20     DEFINED         13          19
  164  SION        REAL                  SCAN2        REFS          5
  165  SIVE        REAL                  SCAN2        REFS          5
   26  VALUE       REAL                  SCAN2        REFS          5         7          16          27          28
                                                   DEFINED         24        30
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS             TYPE    ARGS          REFERENCES
       PARSE                    4               16          28

STATEMENT LABELS                  DEF LINE    REFERENCES
   41  386                           16           12
    0  387                           15           14
    0  388           INACTIVE        18           17
   63  389                           24           17
   66  390                           25           11          17
    0  391           INACTIVE        30           29
  107  392                           31           26          29
    0  393                           32           25
  122  394                           36           29
  137  901       FMT                 21           20
  154  913       FMT                 35           34

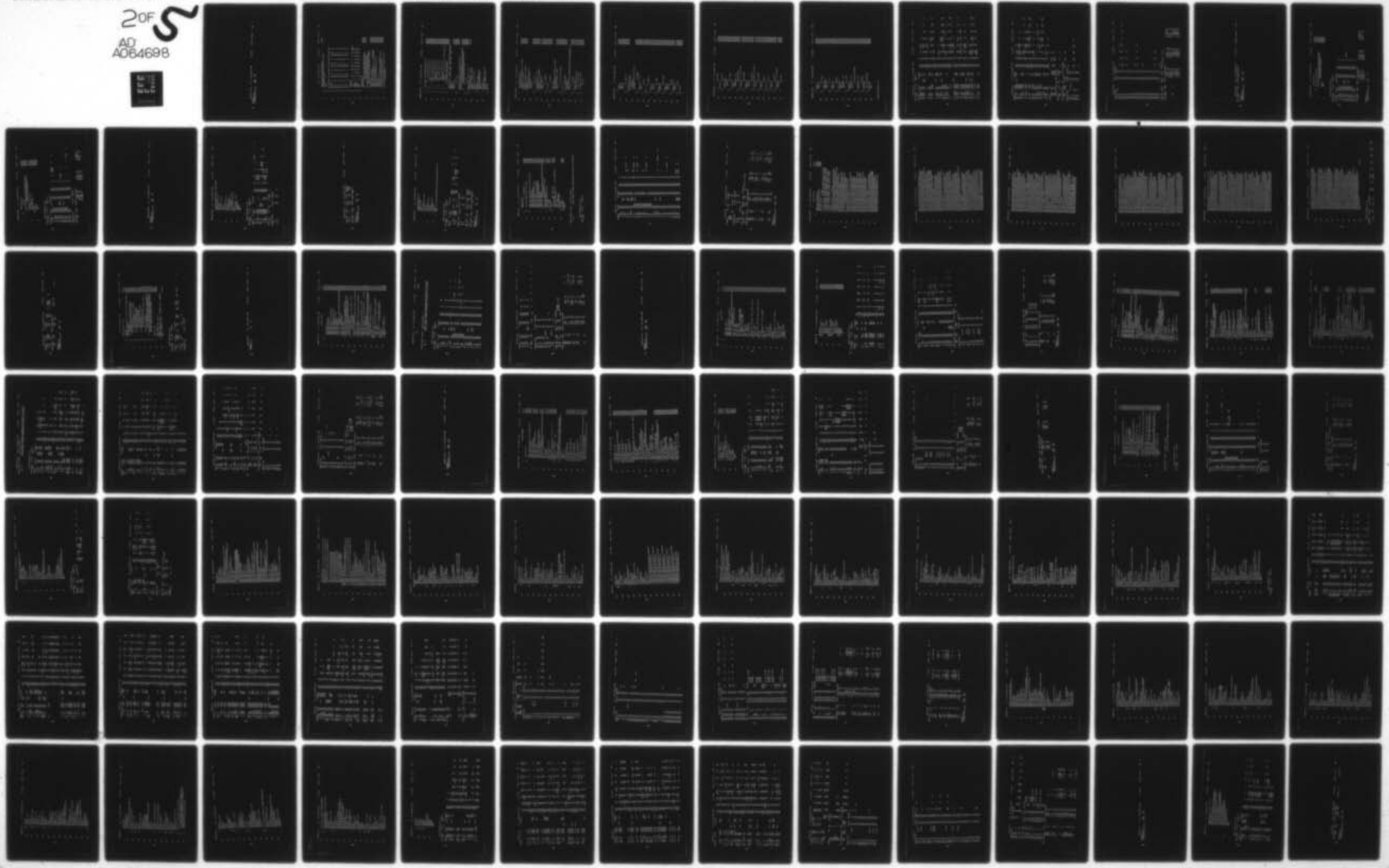
LOOPS  LABEL     INDEX       FROM-TO      LENGTH     PROPERTIES
   52  387        J           14 15          68        INSTACK
   67  393      * J           25 32         268                      EXT REFS     EXITS    NOT INNER
   71  392      * K           26 31         218                      EXT REFS     EXITS

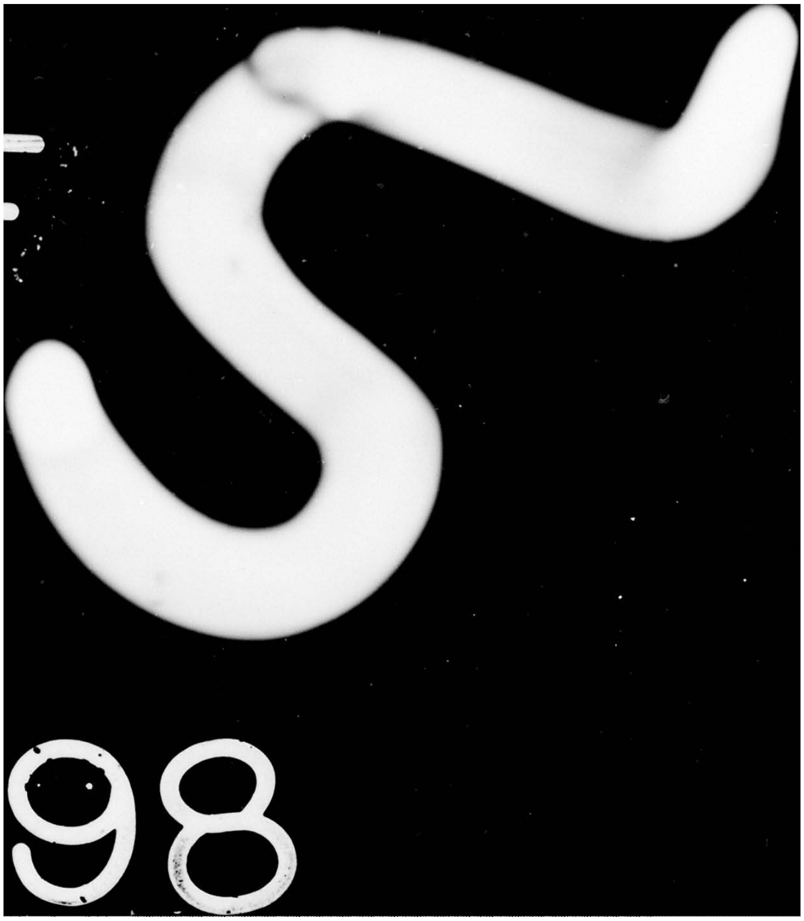
COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       CSTBK       1000                0 CCCST   (1000).
       RL2          813                0 NAME    (5)                  5 LOCATE (8)                   13 IDSCRPT(300)
                                     313 DSCRPT  (150)              463 CHAR   (350)
       SCAN2        119                0 ENTITY  (20)                20 NR     (1)                   21 MODE    (1)
                                      22 VALUE   (1)                 23 NCHAR  (1)                   24 IO      (1)
                                      25 ALIST   (30)                55 BLIST  (30)                  85 CLIST   (30)
                                     115 NLIST   (1)                116 SION   (1)                  117 SIVE    (1)
                                     118 NERR    (1)

 EQUIV CLASSES    LENGTH      MEMBERS - BIAS NAME(LENGTH)
ENTITY  VALUE          1                0 IVALUE (1)
```

AD-A064 698 CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAI--ETC F/G 13/2
SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS. VOLUME III.--ETC(U)
JAN 79 E S LINDOW
UNCLASSIFIED CERL-TR-M-253-VOL-3 NL

2 OF 5
AD
A064698




98

```
      SUBROUTINE CTABLE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     3

STATISTICS
  PROGRAM LENGTH                 173B      123
  CM LABELED COMMON LENGTH      3614B     1932
```

```
      SUBROUTINE PARSE(ENTITY,MODE,VAL,NCHAR)                                  00005500
C     CIVIL ENGINEERING LABOATORY,UNIVERSITY OF ILLINOIS
C     PROGRAMMED BY JW MELIN
C
C     SYNTAX
C
C   NUM CHAR CLASS  NUM CHAR CLASS  NUM CHAR CLASS  NUM CHAR CLASS
C
C    00 NONE   5     20  P     5     40  5     1     60  #     8
C    01  A     5     21  Q     5     41  6     1     61  ●     6
C    02  B     5     22  R     5     42  7     1     62  %     8
C    03  C     5     23  S     5     43  8     1     63  :     8
C    04  D     5     24  T     5     44  9     1     64  '     6
C    05  E     4     25  U     5     45  +     2     65  _     8
C    06  F     5     26  V     5     46  -     3     66  !     8
C    07  G     5     27  W     5     47  *     8     67  ?     8
C    10  H     5     30  X     5     50  /     8     70  &     6
C    11  I     5     31  Y     5     51  (     8     71  '     8
C    12  J     5     32  Z     5     52  )     8     72  <     8
C    13  K     5     33  0     1     53  $    10     73  >     8
C    14  L     5     34  1     1     54  =     8     74        8
C    15  M     5     35  2     1     55        9     75  <     8
C    16  N     5     36  3     1     56  ,     8     76  %     8
C    17  O     5     37  4     1     57  .     7     77  ;     8
C
C     SEMANTICS
C     STATE/CLASS      1    7    5    6    2    3    4   10    8
C                    NUMB   .   ALP  SEP   +    -    E    $   SPECIAL
C     START       0    4    5   11    1    3    2   11   17   14
C     NUMBER      1    4    5   11    6   11   11    8    6    6
C     EXPONENT    2    9   11   11   10    8    7   11   10   10
C     ALPHA       3   12   18   12   13   12   12   12   13   13
C     STRING      4   12   12   12   12   12   12   12   13   16
C     NAME        5   20   19   20   13   20   20   20   13   13
C
      DIMENSION BSTE(13)
      REAL ENTITY(20)                                                          00005700
      COMMON/PARS/BUFR(15),COL,ILABEL,INUNIT,IOUT,IPRINT,                      00005800
     1          ITAB(64),JSTART(72),JUMP,LIMIT,LIST(10),                       00005801
     2          MARK,MARKW,NENT,ON,PSTATE,SKIP,NFIL                            00005802
      COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
     1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
     2    ISUBHOR,BMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
C     REAL ANS(14)                                                             00005900
      LOGICAL IPRINT,FILSW,LABSW                                               00006000
      INTEGER ICLASS (64),ISTATE(110),             FILPT,PSTATE                00006100
C     INTEGER ICLASS (64),ISTATE(110),NSTART(72),FILPT,PSTATE                  00006100
      INTEGER CLASS,STATE,SKIP,EXP                                             00006200
C     INTEGER CLASS,STATE,SKIP,EXP,ILIST(1),JTAB(1)                            00006200
      INTEGER COL                                                              00006300
      EQUIVALENCE(FLT,INT)                                                     00006400
      DATA BLANK/6H      /,DOL/6H$     /,TESTC/6HC     /                       00006500
      DATA L/0/,FILPT/1/,ISIG/1/,NSIG/1/,INT/0/,F/.1/,EXP/0/                   00006600
      DATA NDOT/0/, FILSW/.TRUE./,LABSW/.FALSE./                               00006700
C          0 1 2 3 4 5 6 7 8 9 =                                               00007000
      DATA ICLASS/ 5*5,4,21*5,10*1,2,3,4*8,10,8,9,8,7,8,6,
     1          2*8,6,3*8,6,7*8 /
```

```
      C            D + - E A " . , B $
            DATA ISTATE / 18,17,16,26,26,30,32,29, 6, 7,                  00008900
      C        1     GET                                                  00009000
           1           18,17,16,26,26,13,32,29, 6, 7,                     00009100
      C      2     +-                                                     00009200
           2          18, 8, 8, 8, 8, 8,20, 8, 8, 8,                      00009300
      C       3     INTEGER                                               00009400
           3          19,11,11,28,28,11,20,11,11,11,                      00009500
      C        4      REAL                                                00009600
           4          21,10,10,22,28,10,28,10,10,10,                      00009700
      C        5      START EXP                                           00009800
           5          25,24,23,28,28, 9,28, 9, 9, 9,                      00009900
      C        6      EXP                                                 00010000
           6          25, 9, 9,28,28, 9,28, 9, 9, 9,                      00010100
      C        7      LABEL                                               00010200
           7           4, 8, 4, 4, 4, 8,27, 8, 8, 8,                      00010300
      C        8      NAME, STRING                                        00010400
           8          4,14,14, 4, 4,14,27,14,14,14, 4,4,4,4,4,12,4,4,4,33, 00010500
      C        9      ANYTEXT                                             00010600
           9          4, 8, 8, 4, 4, 8, 4, 8, 8, 8  /                     00010700
      C           ENTRY SCAN(ENTITY,MODE,VAL,NCHAR)                       00010800
      C                                                                   00010900
            DATA BSTE /6HTL    ,6HTDR   ,6HTD    ,6HPGLEND,6HAPRUN ,6HPGLBRK,6
           1HAPEND ,6HTMP   ,6HELIM  ,6HCOST  ,6HRUN   ,6HRC    ,6HCD    /
            NBLANK=0
            NENT=NENT+1                                                   00011000
            NCHAR = 0                                                     00011100
            STATE = PSTATE                                                00011200
      C                                                                   00011300
      C           GO TO ACTION                                            00011400
      C                                                                   00011500
          1 IF(LIMIT.EQ.3) WRITE(6,2) JUMP,MODE,CLASS,STATE,L
          2 FORMAT(18H  JUMP MOD CLA STA,5I4)
            GO TO (10,20,30,40,50,60,70,80,90,100,110,120,130,140,150,160, 00011800
           1        170,180,190,200,210,220,230,240,250,260,270,280,       00011900
           2        290,300,310,320,330,340), JUMP                         00012000
      C                                                                   00012100
      C           GET A LINE                                              00012200
      C                                                                   00012300
       10   READ(INUNIT,11) (BUFR(I),I=1,14)
         11 FORMAT(13A6,A2)                                               00012500
            IF(BUFR(1).NE.6HFROST )  GO TO 99
            WRITE(3,11)   (BUFR(I) ,I=1,14)
            REWIND 3
            WRITE(6,11)(BUFR(I),I=1,14)
            GO TO 10
         99 CONTINUE
            IF(EOF(INUNIT)) 16,8
        8   IF(BUFR(1).NE.6HORNAGE)GO TO 9
            WRITE(12,11)(BUFR(I),I=1,14)
            REWIND 12
            GO TO 10
        9   DO 400 IX=1,13
            IF(BUFR(1).NE.BSTE(IX)) GO TO 400
            WRITE(2,11) (BUFR(I),I=1,14)
            GO TO 10
      400   CONTINUE
      IF(.NOT.IPRINT) GO TO 15
      IF(ILABEL.EQ.0) GO TO 13                                00012700
      WRITE(IOUT,12) ILABEL, (BUFR(I), I=1, MARKW)            00012800
   12 FORMAT(1X,I5,1X,13A6,A2)                                00012900
      GO TO 15                                                00013000
   13 WRITE(IOUT,14) (BUFR(I),I=1,MARKW)                      00013100
   14 FORMAT(1X,13A6,A2)                                      00013200
  15  BX=BLANK
      CALL CONCAT(BUFR(1),0,BX,0,12)
      IF(BX.EQ.TESTC) GO TO 10
      BUFR(13)=DOL
      GO TO 20                                                00013600
C                                                             00013700
C            END OF FILE                                      00013800
C                                                             00013900
   16 IF(FILPT.LE.NFIL) GO TO 18                              00014000
      WRITE(IOUT,17)                                          00014100
   17 FORMAT(20H ALL DATA PROCESSED    )                      00014200
      STOP 1061
   18 INUNIT = LIST(FILPT)                                    00014400
      FILPT = FILPT + 1                                       00014500
      GO TO 10                                                00014600
C                                                             00014700
C            NEXT CHARACTER                                   00014800
C                                                             00014900
   20 COL=COL + 1                                             00015000
C                                                             00015100
C            GET CHARACTER                                    00015200
C                                                             00015300
   30 L=0
      LL= (COL+5)/6
      CALL CONCAT(BUFR(LL),6*MOD(COL-1,6),L,54,6)
      CLASS = ICLASS(L+1)                                     00015600
      JUMP =ISTATE(10*STATE + CLASS)                          00015700
      GO TO 1                                                 00015800
C                                                             00015900
C            SET JUMP TO NEXT CHARACTER                       00016000
C                                                             00016100
   40 JUMP = 2                                                00016200
C                                                             00016300
C            PACK CHARACTER                                   00016400
   50 NCHAR = NCHAR + 1                                       00016600
      L1=(NCHAR+3)/4
      L2=(COL+5)/6
      CALL CONCAT(BUFR(L2),6*MOD(COL-1,6),ENTITY(L1),6*MOD(NCHAR-1,4),6)
      GO TO 1                                                 00017000
C                                                             00017100
C            COUNT BLANKS                                     00017200
C                                                             00017300
   60 NBLANK = NBLANK + 1                                     00017400
      IF(NBLANK.LE.LIMIT) GO TO 20                            00017500
C                                                             00017600
C        CHECK IF END OF STRING                               00017700
C                                                             00017800
      IF(PSTATE.EQ.1) GO TO 130                               00017900
C                                                             00018000
C            END LINE                                         00018100
```

```
C                                                                    00018200
   70 JUMP = 1                                                       00018300
      MODE = 9                                                       00018400
      COL = 0                                                        00018500
      NENT = 0                                                       00018600
      GO TO 150                                                      00018700
C                                                                    00018800
C             PACK BLANK EXIT                                        00018900
C                                                                    00019000
   80 JUMP = 3                                                       00019100
   85 I = MOD(NCHAR,4)*6
      IF(I.EQ. 0) GO TO 150
      L = 24 - I
      L1=(NCHAR+3)/4
      CALL CONCAT(BLANK,I,ENTITY(L1),I,L)
      GO TO 150                                                      00019400
C                                                                    00019700
C                    END EXPONENT                                    00019800
C                                                                    00019900
   90 FLT = FLT * 10. ** EXP                                         00020000
      EXP = 0                                                        00020100
      NSIG = 1                                                       00020200
C                                                                    00020300
C             END REAL                                               00020400
C                                                                    00020500
  100 F = 0.1                                                        00020600
C                                                                    00020700
C             END INTEGER                                            00020800
C                                                                    00020900
  110 VAL = FLT                                                      00021000
      ISIG = 1                                                       00021100
      INT = 0                                                        00021200
      GO TO 80                                                       00021300
C                                                                    00021400
C             END STRING                                             00021500
C                                                                    00021600
  120 SKIP = COL                                                     00021700
  340 JUMP = 2                                                       00021800
      GO TO 85                                                       00021900
C                                                                    00022000
C             END GET STRING                                         00022100
C                                                                    00022200
  130 MODE = 8                                                       00022300
      PSTATE = 0                                                     00022400
      JUMP = 2                                                       00022450
      GO TO 150                                                      00022500
C                                                                    00022600
C             END NAME                                               00022700
C                                                                    00022800
  140 NCHAR = NDOT + 1                                               00022900
      NDOT= 0
      GO .TO 80                                                      00023000
C                                                                    00023100
C             RETURN                                                 00023200
C                                                                    00023300
 150  RETURN                                                         00023400
C                                                                    00023500
```

```
C             MINUS FOUND                                                00023600
C                                                                        00023700
  160 ISIG = -1                                                          00023800
C                                                                        00023900
C             PLUS FOUND                                                 00024000
C                                                                        00024100
  170 STATE = 2                                                          00024200
      INT = ITAB(L)                                                      00024300
      VAL = FLT                                                          00024400
      GO TO 310                                                          00024500
C                                                                        00024600
C             START INTEGER                                              00024700
C                                                                        00024800
  180 STATE = 3                                                          00024900
      INT = 0                                                            00024950
      MODE = 1                                                           00025000
      JSTART(NENT) = COL                                                 00025100
C                                                                        00025200
C             CONTINUE INTEGER                                           00025300
C                                                                        00025400
  190 INT = INT * 10 + (L-27) * ISIG
      GO TO 40                                                           00025600
C                                                                        00025700
C             CHANGE TO REAL                                             00025800
C                                                                        00025900
  200 STATE = 4                                                          00026000
      MODE = 2                                                           00026100
      FLT = INT                                                          00026200
      GO TO 40                                                           00026300
C                                                                        00026400
C             CONTINUE REAL                                              00026500
C                                                                        00026600
  210 FLT = FLT + FLOAT((L-27)*ISIG)*F
      F = F * 0.1                                                        00026800
      GO TO 40                                                           00026900
C                                                                        00027000
C             START EXPONENT                                             00027100
C                                                                        00027200
  220 STATE = 5                                                          00027300
      GO TO 40                                                           00027400
C                                                                        00027500
C             MINUS EXP                                                  00027600
C                                                                        00027700
  230 NSIG = -1                                                          00027800
C                                                                        00027900
C             PLUS EXP                                                   00028000
C                                                                        00028100
  240 STATE = 6                                                          00028200
      GO TO 40                                                           00028300
C                                                                        00028400
C             CONTINUE EXP                                               00028500
C                                                                        00028600
  250 EXP = EXP * 10 + (L-27)*NSIG
      STATE = 6                                                          00028800
      GO TO 40                                                           00028900
C                                                                        00029000
C             START LABEL                                                00029100
```

```
C                                                                       00029200
  260 STATE = 7                                                         00029300
      MODE = 3                                                          00029400
      GO TO 310                                                         00029500
C                                                                       00029600
C            START NAME                                                 00029700
C                                                                       00029800
  270 STATE = 8                                                         00029900
      NDOT = NDOT + 1                                                   00030000
      NCHAR = NDOT                                                      00030100
      GO TO 20                                                          00030200
C                                                                       00030300
C            ANY TEXT                                                   00030400
C                                                                       00030500
  280 MODE = 5                                                          00030600
      STATE = 10                                                        00030700
      GO TO 310                                                         00030800
C                                                                       00030900
C            SEPARATER                                                  00031000
C                                                                       00031100
  290 INT = ITAB(L)                                                     00031200
      VAL = FLT                                                         00031300
      MODE = 6                                                          00031400
      JUMP = 34                                                         00031500
      JSTART(NENT) = COL                                                00031600
      GO TO 50                                                          00031700
C                                                                       00031800
C            START STRING                                               00031900
C                                                                       00032000
  300 STATE = 9                                                         00032100
      MODE = 7                                                          00032200
      JSTART(NENT) = COL                                                00032250
      GO TO 20                                                          00032300
C                                                                       00032400
C            SET BEGINNING COL NUMBER                                   00032500
C                                                                       00032600
C                                                                       00016500
  310 JSTART(NENT) = COL                                                00032700
      GO TO 40                                                          00032800
C                                                                       00032900
C            START REAL                                                 00033000
C                                                                       00033100
  320 JSTART(NENT) = COL                                                00033200
      GO TO 200                                                         00033300
C                                                                       00033310
C     END LINE AND END STRING                                           00033320
C                                                                       00033330
  330 SKIP = COL                                                        00033340
      GO TO 80                                                          00033350
      END
```

SYMBOLIC REFERENCE MAP (R=3)

```
        SUBROUTINE PARSE     74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00        PAGE     7

ENTRY POINTS      DEF LINE      REFERENCES
     4  PARSE            1       227

VARIABLES      SN  TYPE            RELOCATION
     10  AMINOR    REAL                  KARD         REFS       41
    632  BLANK     REAL                               REFS      122       186   DEFINED        52
     16  BMOIST    REAL                  KARD         REFS       41
    763  BSTE      REAL        ARRAY                  REFS       36       111   DEFINED        80
      0  BUFR      REAL        ARRAY     PARS         REFS       38        99       100       102       106       107       111
                                                       112      117       120       123       146       159
                                                   DEFINED       97       125
    756  BX        REAL                               REFS      123       124   DEFINED       122
     21  CBR10     REAL                  KARD         REFS       41
     20  CBR8      REAL                  KARD         REFS       41
    751  CLASS     INTEGER                            REFS       48        89       148   DEFINED       147
     17  COL       INTEGER               PARS         REFS       38        50       140       145       146       158       159
                                                       208      245       310       317       323       328       333
                                                   DEFINED      140       175
     22  COMS      REAL        ARRAY     KARD         REFS       41
      0  DESIGN    REAL                  KARD         REFS       41
      3  DFI       REAL                  KARD         REFS       41
    633  DOL       REAL                               REFS      125   DEFINED        52
     17  DRYWT     REAL                  KARD         REFS       41
      0  ENTITY    REAL        ARRAY      F.P.        REFS       37       159       186   DEFINED         1
    642  EXP       INTEGER                            REFS       48       191       281   DEFINED        53       192       281
    641  F         REAL                               REFS      261       262   DEFINED        53       197       262
    636  FILPT     INTEGER                            REFS       46       130       134       135   DEFINED        53       135
    644  FILSW     LOGICAL                            REFS       45   DEFINED        54
      6  FLEXPT    REAL                  KARD         REFS       41
    762  FLT       REAL                               REFS       51       191       201       237       261       307
                                                   DEFINED      191       256       261
    754  I         INTEGER                            REFS       97       100       102       107       112       117       120
                                                       183      184     2*186   DEFINED        97       100       102       107
                                                       112      117       120       182
   1000  ICLASS    INTEGER     ARRAY                  REFS       46       147   DEFINED        56
      1  ICONFIG   INTEGER               KARD         REFS       41
     11  IFGRP     INTEGER               KARD         REFS       41
     20  ILABEL    INTEGER               PARS         REFS       38       116       117
    762  INT       INTEGER                            REFS       51       249       256   DEFINED        53       203       236
                                                       243      249       306
     21  INUNIT    INTEGER               PARS         REFS       38       105   DEFINED       134   I/O REFS       97
     22  IOUT      INTEGER               PARS         REFS       38  I/O REFS       117       120       131
      5  IPAVT     INTEGER               KARD         REFS       41
     23  IPRINT    LOGICAL               PARS         REFS       38        45       115
    637  ISIG      INTEGER                            REFS      249       261   DEFINED        53       202       231
   1100  ISTATE    INTEGER     ARRAY                  REFS       46       148   DEFINED        59
     14  ISUBCBR   INTEGER               KARD         REFS       41
     15  ISUBHOR   INTEGER               KARD         REFS       41
     24  ITAB      INTEGER     ARRAY     PARS         REFS       38       236       306
    755  IX        INTEGER                            REFS      111   DEFINED       110
    124  JSTART    INTEGER     ARRAY     PARS         REFS       38   DEFINED       245       310       317       323       328
    234  JUMP      INTEGER               PARS         REFS       38        89        91   DEFINED       148       153       173
                                                       181      209       216       309
    635  L         INTEGER                            REFS       89       146       147       186       236       249       261
                                                       281      306   DEFINED        53       144       184
    645  LABSW     LOGICAL                            REFS       45   DEFINED        54
     26  LCIND     INTEGER               KARD         REFS       41
```

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       SUBROUTINE PARSE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00      PAGE      8

VARIABLES     SN  TYPE           RELOCATION
  235  LIMIT     INTEGER             PARS         REFS        38        89       165
  236  LIST      INTEGER    ARRAY    PARS         REFS        38       134
  757  LL        INTEGER                          REFS       146   DEFINED       145
  760  L1        INTEGER                          REFS       159       186   DEFINED       157       185
  761  L2        INTEGER                          REFS       159   DEFINED       158
  250  MARK      INTEGER             PARS         REFS        38
  251  MARKW     INTEGER             PARS         REFS        38       117       120
    0  MODE      INTEGER              F.P.        REFS        89   DEFINED         1       174       214       244       255
                                                   288       300       308       316
  753  NBLANK    INTEGER                          REFS       164       165   DEFINED        82       164
    0  NCHAR     INTEGER              F.P.        REFS       156       157       159       182       185
                                               DEFINED         1        84       156       221       295
  643  NDOT      INTEGER                          REFS       221       294       295   DEFINED        54       222       294
  252  NENT      INTEGER             PARS         REFS        38        83       245       310       317       323       328
                                               DEFINED        83       176
  256  NFIL      INTEGER             PARS         REFS        38       130
  640  NSIG      INTEGER                          REFS       201   DEFINED        53       193       272
  253  ON        REAL                PARS         REFS        38
   27  OVR       REAL                KARD         REFS        41
  254  PSTATE    INTEGER             PARS         REFS        38        46        85       169   DEFINED       215
    7  RIGOPT    REAL                KARD         REFS        41
  255  SKIP      INTEGER             PARS         REFS        38        48   DEFINED       208       333
   12  SMOIST    REAL                KARD         REFS        41
  752  STATE     INTEGER                          REFS        48        89       148   DEFINED        85       235       242
                                                   254       267       276       282       287       293       301       315
   13  SUBMOD    REAL                KARD         REFS        41
    4  TOFP      REAL                KARD         REFS        41
  634  TESTC     REAL                             REFS       124   DEFINED        52
    2  TRAFF     REAL                KARD         REFS        41
    0  VAL       REAL                 F.P.     DEFINED         1       201       237       307

FILE NAMES        MODE
       TAPE12    FMT                   WRITES      107    MOTION       108
       TAPE2     FMT                   WRITES      112
       TAPE3     FMT                   WRITES      100    MOTION       101
       TAPE6     FMT                   WRITES       89       102
       VARIABLES USED AS FILE NAMES. SEE ABOVE

EXTERNALS          TYPE   ARGS       REFERENCES
       CONCAT               5            123       146       159       186
       EOF       REAL       1            105

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       FLOAT     REAL       1  INTRIN              261
       MOD       INTEGER    2  INTRIN              146     2*159       182

STATEMENT LABELS             DEF LINE   REFERENCES
   17  1                        89       149       160
  656  2       FMT              90        89
    0  8           INACTIVE    106       105
  124  9                       110       106
   73  10                       97        91       103       109       113       124       136
  667  11      FMT              98        97       100       102       107       112
  720  12      FMT             118       117
  153  13                      120       116
  727  14      FMT             121       120
  161  15                      122       115       119
```

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       SUBROUTINE PARSE      74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00      PAGE      9

STATEMENT LABELS             DEF LINE   REFERENCES
  174  16                      130      105
  735  17      FMT             132      131
  204  18                      134      130
  212  20                      140       91        126       165       296       318
  215  30                      144       91
  245  40                      153       91        250       257       263       268       277       283       324
  247  50                      156       91        311
  301  60                      164       91
  312  70                      173       91
  323  80                      181       91        204       223       334
  325  85                      182      210
  347  90                      191       91
  110  99                      104       99
  357  100                     197       91
  362  110                     201       91
  372  120                     208       91
  400  130                     214       91        169
  410  140                     221       91
  416  150                     227       91        177       183       187       217
  420  160                     231       91
  422  170                     235       91
  432  180                     242       91
  443  190                     249       91
  451  200                     254       91        329
  460  210                     261       91
  471  220                     267       91
  474  230                     272       91
  475  240                     276       91
  501  250                     281       91
  511  260                     287       91
  516  270                     293       91
  525  280                     300       91
  533  290                     306       91
  550  300                     315       91
  560  310                     323       91        238       289       302
  564  320                     328       91
  570  330                     333       91
  375  340                     209       91
  134  400                     114      110        111

LOOPS  LABEL    INDEX     FROM-TO    LENGTH     PROPERTIES
  125  400   * IX          110 114      128              EXT REFS    EXITS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       PARS       175               0 BUFR   (15)                15 COL    (1)                 16 ILABEL (1)
                                   17 INUNIT (1)                 18 IOUT   (1)                 19 IPRINT (1)
                                   20 ITAB   (64)                84 JSTART (72)               156 JUMP   (1)
                                  157 LIMIT  (1)                158 LIST   (10)               168 MARK   (1)
                                  169 MARKW  (1)                170 NENT   (1)                171 ON     (1)
                                  172 PSTATE (1)                173 SKIP   (1)                174 NFIL   (1)
       KARD        24               0 DESIGN (1)                  1 ICONFIG(1)                  2 TRAFF  (1)
                                    3 DFI    (1)                  4 TDFP   (1)                  5 IPAVT  (1)
                                    6 FLEXPT (1)                  7 RIGDPT (1)                  8 AMINOR (1)
                                    9 IFGRP  (1)                 10 SMOIST (1)                 11 SUBMOD (1)
                                   12 ISUBCBR(1)                 13 ISUBHOR(1)                 14 BMOIST (1)
                                   15 DRYWT  (1)                 16 CBR8   (1)                 17 CBR10  (1)
                                   18 COMS   (4)                 22 LCIND  (1)                 23 OVR    (1)
```

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      SUBROUTINE PARSE      74/74   OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE    10

EQUIV CLASSES   LENGTH     MEMBERS - BIAS NAME(LENGTH)
      FLT          1                 0 INT     (1)

STATISTICS
  PROGRAM LENGTH                12608     688
  CM LABELED COMMON LENGTH       3078     199
```

```
SUBROUTINE RDLINE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     1

    1               SUBROUTINE RDLINE                                                   00035100
              C                                                                         00034800
              C    SKIP TO NEXT LINE (READLINE)                                         00034900
              C                                                                         00035000
    5               COMMON/PARS/BUFR(15),COL,ILABEL,INUNIT,IOUT,IPRINT,                 00035150
                   1             ITAB(64),JSTART(72),JUMP,LIMIT,LIST(10),               00035151
                   2             MARK,MARKW,NENT,ON,PSTATE,SKIP                         00035152
                    JUMP = 1                                                            00035200
                    RETURN                                                              00035300
   10               END                                                                 00035350


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    2  RDLINE          1             9

VARIABLES       SN  TYPE            RELOCATION
     0  BUFR        REAL       ARRAY    PARS         REFS        5
    17  COL         REAL                PARS         REFS        5
    20  ILABEL      INTEGER             PARS         REFS        5
    21  INUNIT      INTEGER             PARS         REFS        5
    22  IOUT        INTEGER             PARS         REFS        5
    23  IPRINT      INTEGER             PARS         REFS        5
    24  ITAB        INTEGER    ARRAY    PARS         REFS        5
   124  JSTART      INTEGER    ARRAY    PARS         REFS        5
   234  JUMP        INTEGER             PARS         REFS        5    DEFINED        8
   235  LIMIT       INTEGER             PARS         REFS        5
   236  LIST        INTEGER    ARRAY    PARS         REFS        5
   250  MARK        INTEGER             PARS         REFS        5
   251  MARKW       INTEGER             PARS         REFS        5
   252  NENT        INTEGER             PARS         REFS        5
   253  ON          REAL                PARS         REFS        5
   254  PSTATE      REAL                PARS         REFS        5
   255  SKIP        REAL                PARS         REFS        5

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
    PARS          174                0 BUFR    (15)           15 COL     (1)              16 ILABEL  (1)
                                    17 INUNIT  (1)            18 IOUT    (1)              19 IPRINT  (1)
                                    20 ITAB    (64)           84 JSTART  (72)            156 JUMP    (1)
                                   157 LIMIT   (1)           158 LIST    (10)            168 MARK    (1)
                                   169 MARKW   (1)           170 NENT    (1)             171 ON      (1)
                                   172 PSTATE  (1)           173 SKIP    (1)

STATISTICS
  PROGRAM LENGTH                  68        6
  CM LABELED COMMON LENGTH      2568      174
```

```
      SUBROUTINE BACKUP      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00         PAGE      1

 1                  SUBROUTINE BACKUP(I)
             C                                                                   00036700
             C            BACKSPACE                                              00036800
             C                                                                   00036900
 5                  COMMON/PARS/BUFR(15),COL,ILABEL,INUNIT,IOUT,IPRINT,          00037050
                   1           ITAB(64),JSTART(72),JUMP,LIMIT,LIST(10),          00037051
                   2           MARK,MARKW,NENT,ON,PSTATE,SKIP                    00037052
                    INTEGER COL
                    IF(NENT.LT.I) GO TO 400                                      00037100
10                  NENT = NENT -I                                               00037200
                    COL = JSTART(NENT + 1)                                       00037300
                    RETURN                                                       00037400
                400 COL = 0                                                      00037410
                    JUMP = 2                                                     00037420
15                  RETURN                                                       00037430
                    END                                                          00037450


      SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE      REFERENCES
     4  BACKUP          1          12          15

  VARIABLES     SN  TYPE             RELOCATION
      0  BUFR       REAL         ARRAY    PARS         REFS          5
     17  COL        INTEGER               PARS         REFS          5        8    DEFINED       11          13
      0  I          INTEGER               F.P.         REFS          9       10    DEFINED        1
     20  ILABEL     INTEGER               PARS         REFS          5
     21  INUNIT     INTEGER               PARS         REFS          5
     22  IOUT       INTEGER               PARS         REFS          5
     23  IPRINT     INTEGER               PARS         REFS          5
     24  ITAB       INTEGER      ARRAY    PARS         REFS          5
    124  JSTART     INTEGER      ARRAY    PARS         REFS          5       11
    234  JUMP       INTEGER               PARS         REFS          5   DEFINED        14
    235  LIMIT      INTEGER               PARS         REFS          5
    236  LIST       INTEGER      ARRAY    PARS         REFS          5
    250  MARK       INTEGER               PARS         REFS          5
    251  MARKW      INTEGER               PARS         REFS          5
    252  NENT       INTEGER               PARS         REFS          5        9        10        11    DEFINED       10
    253  ON         REAL                  PARS         REFS          5
    254  PSTATE     REAL                  PARS         REFS          5
    255  SKIP       REAL                  PARS         REFS          5

  STATEMENT LABELS              DEF LINE   REFERENCES
     20  400                       13          9

  COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
        PARS         174                0 BUFR    (15)          15 COL     (1)              16 ILABEL (1)
                                       17 INUNIT  (1)           18 IOUT    (1)              19 IPRINT (1)
                                       20 ITAB    (64)          84 JSTART  (72)            156 JUMP   (1)
                                      157 LIMIT   (1)          158 LIST    (10)            168 MARK   (1)
                                      169 MARKW   (1)          170 NENT    (1)             171 ON     (1)
                                      172 PSTATE  (1)          173 SKIP    (1)
      SUBROUTINE BACKUP      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     2

    STATISTICS
      PROGRAM LENGTH                 24B       20
      CM LABELED COMMON LENGTH      256B      174
      SUBROUTINE CONCAT      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00         PAGE     1

 1                SUBROUTINE CONCAT(IFROM,LBIT,JTO,MBIT,NBITS)
                  COMMON/JP/JP(60)
                  DIMENSION JI(60),JO(60)
                  DATA ICK/1/
 5                IFR=IFROM
                  IF (ICK.EQ.0) GO TO 1
                  ICK=0
                  JP(1)=1
                  DO 2 I=2,60
10                JP(I)=JP(I-1)+JP(I-1)
                2 CONTINUE
                1 CALL BBRK(IFR,JI)
                  CALL BBRK(JTO,JO)
                  IF (NBITS.EQ.0) GO TO 10
15                DO 3 I=1,NBITS
                3 JO(61-MBIT-I)=JI(61-LBIT-I)
               10 JTO=0
                  DO 4 I=1,60
                  IF (JO(I).EQ.0) GO TO 4
20                JTO=JTO+JP(I)
                4 CONTINUE
                  RETURN
                  END


      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
    4  CONCAT          1            22

 VARIABLES       SN  TYPE              RELOCATION
   106  I            INTEGER                            REFS        3*10      2*16       19        20    DEFINED       9        15
                                                          18
   104  ICK          INTEGER                            REFS           6   DEFINED        4         7
   105  IFR          INTEGER                            REFS          12   DEFINED        5
     0  IFROM        INTEGER                F.P.        REFS           5   DEFINED        1
   107  JI           INTEGER     ARRAY                  REFS           3        12       16
   203  JO           INTEGER     ARRAY                  REFS           3        13       19   DEFINED       16
     0  JP           INTEGER     ARRAY     JP           REFS           2      2*10       20   DEFINED        8        10
     0  JTO          INTEGER                F.P.        REFS          13        20  DEFINED         1       17        20
     0  LBIT         INTEGER                F.P.        REFS          16   DEFINED        1
     0  MBIT         INTEGER                F.P.        REFS          16   DEFINED        1
     0  NBITS        INTEGER                F.P.        REFS          14        15  DEFINED         1

 EXTERNALS           TYPE    ARGS          REFERENCES
        BBRK                   2              12         13

 STATEMENT LABELS                DEF LINE     REFERENCES
    37  1                            12           6
     0  2                            11           9
     0  3                            16          15
    71  4                            21          18         19
    60  10                           17          14
```

```
      SUBROUTINE CONCAT      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     2

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   30  2         I             9 11         6B      INSTACK
   50  3         I            15 16         7B      INSTACK
   63  4         I            18 21        11B         OPT

COMMON BLOCKS    LENGTH       MEMBERS - BIAS NAME(LENGTH)
       JP            60                  0 JP      (60)

STATISTICS
  PROGRAM LENGTH                  311B      201
  CM LABELED COMMON LENGTH         74B       60
```

```
      SUBROUTINE BBRK       74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420       09/02/77  13.54.00       PAGE     1

 1                  SUBROUTINE BBRK(IFROM,IB)
                    COMMON/JP/JP(60)
                    DIMENSION IB(60)
                    IZ=0
 5                  DO 3 I=1,60
                    IF (IFROM-JP(61-I)) 2,4,4
                  2 IB(61-I)=0
                    GO TO 3
                  4 IB(61-I)=1
10                  IFROM=IFROM-JP(61-I)
                    IZ=IZ+1
                  3 CONTINUE
                    IF (IZ.NE.60) GO TO 6
                    DO 5 I=1,60
15                5 IB(I)=0
                  6 RETURN
              C     *****   END OF SCAN PACKAGE*******************************************
                    END


     SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     4  BBRK            1          16

 VARIABLES      SN  TYPE            RELOCATION
    61  I           INTEGER                              REFS         6       7         9        10       15
                                                      DEFINED         5      14
     0  IB          INTEGER     ARRAY     F.P.           REFS         3  DEFINED        1         7        9        15
     0  IFROM       INTEGER               F.P.           REFS         6      10   DEFINED         1       10
    60  IZ          INTEGER                              REFS        11      13   DEFINED         4       11
     0  JP          INTEGER     ARRAY     JP             REFS         2       6        10

 STATEMENT LABELS               DEF LINE   REFERENCES
     0  2           INACTIVE        7          6
    42  3                          12          5        8
    32  4                           9        2*6
     0  5                          15         14
    57  6                          16         13

 LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
    22  3         I            5 12        238          OPT
    52  5         I           14 15         48        INSTACK

 COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
        JP           60                  0 JP     (60)

 STATISTICS
   PROGRAM LENGTH                    71B       57
   CM LABELED COMMON LENGTH          74B       60
```

```
      PROGRAM LSSP        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE      1

  1                 OVERLAY(LIFE,2,0)
                    PROGRAM LSSP
              C                    H51 - MAIN PROGRAM                                             H51A002
              C                                                                                   H51A003
  5           C     H51 COMPUTES BENDING STRESS IN CONCRETE                                       H51A004
              C                                                                                   H51A005
              C                                                                                   H51A006
              C     COMMON /ABLK/ A,AP(10),AH(10),AK(10),ASIG(10),AG(10)                          H51A007
                    COMMON /HBLK/ BIGX,BIGY,B                                                     H51A008
 10                 COMMON /DBLK/ DPR,DELTA(10)                                                   H51A009
                    COMMON /EBLK/ E,ERX(50),ERY(50)                                               H51A010
                    COMMON /GBLK/ G,GAMMA(10),GPRINT(100,10)                                      H51A012
                    COMMON /HBLK/ H(10)                                                           H51A013
                    COMMON /IBLK/ ICM(10),ILH,ILD,ISG,INOG                                        H51A014
 15                 COMMON /NBLK/ NOG,NOH,NPT,NX,NY,NOD,NOSG                                      H51A015
                    COMMON /PBLK/ P,PI,PVMTST(10),PHIE                                            H51A016
                    COMMON /RBLK/ RPO,RZERO                                                       H51A017
              C     COMMON /SBLK/ SIGMA(10)                                                       H51A018
                    COMMON /XBLK/ XK,XLA,XLB,XLC,XLD,XMU,XNA,XNB,XNC,XND,XNT,XOP3,XOP6H51A021
 20                1                  ,ZP(100,10),XPZ(4097)                                       H51A022
                    COMMON /YBLK/ YMN(10),WP(100,10) ,YPZ(4097)                                   H51A025
              C     COMMON/STOR/STOSIG(10)
                    COMMON /BLK1/ NZ,NW,VMA,CV(1764)                                              H51A027
                    E = 4000000.0                                                                 H51A037
 25                 XMU = 0.15                                                                    H51A038
                150 CALL PROBRD                                                                   H51A039
                    NPZ=NPT
              C                    START HEIGHT LOOP                                              H51A040
                    DO 100 ILH=1,NOH                                                              H51A041
 30                 RZERO =SQRT( SQRT( (E*H(ILH)**3) / ( 12.*(1.-XMU**2)*XK ) ) )                 H51G0271
                    IF(NPZ .LE. 0) GO TO 75
                    DO 40 I=1,NPZ
                    XPZ(I)= ERX(I)/RZERO
                 40 YPZ(I)=ERY(I)/RZERO
 35                 GO TO 85
                 75 CALL GEOM                                                                     H51A045
                 85 CALL OUTLNE                                                                   H51A046
                100 CONTINUE                                                                      H51A047
                    END


 CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

     29     I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.


         SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     3  LSSP             2
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```
           PROGRAM LSSP       74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE     2

   VARIABLES       SN  TYPE             RELOCATION
        2  B           REAL                 BBLK          REFS        9
        0  BIGX        REAL                 BBLK          REFS        9
        1  BIGY        REAL                 BBLK          REFS        9
        3  CV          REAL       ARRAY     BLK1          REFS       23
        1  DELTA       REAL       ARRAY     DBLK          REFS       10
        0  DPR         REAL                 DBLK          REFS       10
        0  E           REAL                 EBLK          REFS       11       30   DEFINED       24
        1  ERX         REAL       ARRAY     EBLK          REFS       11       33
       63  ERY         REAL       ARRAY     EBLK          REFS       11       34
        0  G           REAL                 GBLK          REFS       12
        1  GAMMA       REAL       ARRAY     GBLK          REFS       12
       13  GPRINT      REAL       ARRAY     GBLK          REFS       12
        0  H           REAL       ARRAY     HBLK          REFS       13       30
       73  I           INTEGER                            REFS     2*33     2*34   DEFINED       32
        0  ICM         INTEGER    ARRAY     IBLK          REFS       14
       13  ILD         INTEGER              IBLK          REFS       14
       12  ILH         INTEGER              IBLK          REFS       14       30   DEFINED       29
       15  INOG        INTEGER              IBLK          REFS       14
       14  ISG         INTEGER              IBLK          REFS       14
        5  NOD         INTEGER              NBLK          REFS       15
        0  NOG         INTEGER              NBLK          REFS       15
        1  NOH         INTEGER              NBLK          REFS       15       29
        6  NOSG        INTEGER              NBLK          REFS       15
        2  NPT         INTEGER              NBLK          REFS       15       27
       72  NPZ         INTEGER                            REFS       31       32   DEFINED       27
        1  NW          INTEGER              BLK1          REFS       23
        3  NX          INTEGER              NBLK          REFS       15
        4  NY          INTEGER              NBLK          REFS       15
        0  NZ          INTEGER              BLK1          REFS       23
        0  P           REAL                 PBLK          REFS       16
       14  PHIE        REAL                 PBLK          REFS       16
        1  PI          REAL                 PBLK          REFS       16
        2  PVMTST      REAL       ARRAY     PBLK          REFS       16
        0  RPD         REAL                 RBLK          REFS       17
        1  RZERO       REAL                 RBLK          REFS       17       33         34   DEFINED       30
        2  VMA         REAL                 BLK1          REFS       23
       12  WP          REAL       ARRAY     YBLK          REFS       21
        0  XK          REAL                 XBLK          REFS       19       30
        1  XLA         REAL                 XBLK          REFS       19
        2  XLB         REAL                 XBLK          REFS       19
        3  XLC         REAL                 XBLK          REFS       19
        4  XLD         REAL                 XBLK          REFS       19
        5  XMU         REAL                 XBLK          REFS       19       30   DEFINED       25
        6  XNA         REAL                 XBLK          REFS       19
        7  XNB         REAL                 XBLK          REFS       19
       10  XNC         REAL                 XBLK          REFS       19
       11  XND         REAL                 XBLK          REFS       19
       12  XNT         REAL                 XBLK          REFS       19
       13  XOP3        REAL                 XBLK          REFS       19
       14  XOP6        REAL                 XBLK          REFS       19
     1765  XPZ         REAL       ARRAY     XBLK          REFS       19  DEFINED         33
        0  YMN         REAL       ARRAY     YBLK          REFS       21
     1762  YPZ         REAL       ARRAY     YBLK          REFS       21  DEFINED         34
       15  ZP          REAL       ARRAY     XBLK          REFS       19
```

```
        PROGRAM LSSP       74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420         09/02/77  13.54.00        PAGE     3

EXTERNALS            TYPE   ARGS        REFERENCES
          GEOM                0               36
          OUTLNE              0               37
          PROBRD              0               26
          SQRT       REAL     1 LIBRARY     2*30

STATEMENT LABELS                DEF LINE   REFERENCES
     0  40                         34         32
    50  75                         36         31
    52  85                         37         35
     0  100                        38         29
     0  150          INACTIVE      26

LOOPS  LABEL     INDEX    FROM-TO    LENGTH    PROPERTIES
   16  100     * ILH       29 38       40B                 EXT REFS  NOT INNER
   36  40        I         32 34       10B           OPT

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
         ABLK         3              0 BIGX    (1)                 1 BIGY    (1)                 2 B         (1)
         DBLK        11              0 DPR     (1)                 1 DELTA   (10)
         EBLK       101              0 E       (1)                 1 ERX     (50)               51 ERY       (50)
         GBLK      1011              0 G       (1)                 1 GAMMA   (10)               11 GPHINT    (1000)
         HBLK        10              0 H       (10)
         IBLK        14              0 ICM     (10)               10 ILH     (1)                11 ILD       (1)
                                    12 ISG     (1)                13 INOG    (1)
         NBLK         7              0 NOG     (1)                 1 NOH     (1)                 2 NPT       (1)
                                     3 NX      (1)                 4 NY      (1)                 5 NOD       (1)
                                     6 NOSG    (1)
         PBLK        13              0 P       (1)                 1 PI      (1)                 2 PVMTST    (10)
                                    12 PHIE    (1)
         RBLK         2              0 RPD     (1)                 1 RZERO   (1)
         XBLK      5110              0 XK      (1)                 1 XLA     (1)                 2 XLB       (1)
                                     3 XLC     (1)                 4 XLD     (1)                 5 XMU       (1)
                                     6 XNA     (1)                 7 XNB     (1)                 8 XNC       (1)
                                     9 XND     (1)                10 XNT     (1)                11 XOP3      (1)
                                    12 XOP6    (1)                13 ZP      (1000)           1013 XPZ       (4097)
         YBLK      5107              0 YMN     (10)               10 WP      (1000)           1010 YPZ       (4097)
         BLK1      1767              0 NZ      (1)                 1 NW      (1)                 2 VMA       (1)
                                     3 CV      (1764)

STATISTICS
  PROGRAM LENGTH                  74B       60
  CM LABELED COMMON LENGTH     31544B    13156
```

```
                  BLOCK DATA ADATA                                      H51C002
C
C                                                                       H51C004
      COMMON /DBLK/ DPR,DELTA(10)                                       H51C004
      COMMON /BLK1/ NZ,NW,VMA,CV(1764)                                  H51C005
      DATA NZ,NW, VMA / 42, 42, 3.95 /                                  H51C006
      DATA DELTA / 10*0.0 /                                             H51C007
      DATA (CV(J),J=1,84)  / 11.2653,
     Z                     0.,-67.9102,-104.7690,-129.7187,-147.1463,
     1 -159.1829,-167.1212, -171.8469,-174.0075, -174.1014, -172.5242,
     2 -169.5980,-165.5897, -160.7219,-155.1836, -149.1356, -142.7132,
     3 -136.0339,-129.1958, -122.2841,-115.3698, -108.5131, -101.7640,
     4 -95.1643, -88.7480, -82.5425, -76.5687, -70.8433, -65.3777,
     5 -60.1799, -55.2545, -50.6024, -46.2231, -42.1131, -38.2675,
     6 -34.6799, -31.3426, -28.2467, -25.3830, -22.7414, -20.3115,
     7  42*0.0/
      DATA (CV(J),J=85,169)   /  -76.6783,
     30.,59.605,96.436,121.66,139.424,151.807,160.094,165.167,167.67,
     4 168.098,166.846,164.23568,160.532,155.9582,150.7026,144.92514,
     5 138.76222,132.3302144,125.7283426,119.041056,112.339935,
     6 105.685343,99.12778,  92.70913,   86.463666, 80.418988,74.596828,
     7  69.01378,63.681943,58.6094925,53.8012,49.2589334,
     844.981997,40.96759,37.21109,33.706383,30.44609,27.421875,
     924.624596,22.04452,19.6714975, -124.5085,
     A0.,104.5678,175.971,226.3343,262.282,287.656,304.91,315.763,
     B321.4795,323.0404,321.2292,316.68325,309.93196,301.41913,
     C291.51999,280.553665,268.79237,256.468563,243.78064,
     D230.89763,217.96295,205.0977,192.40338,179.9643,167.84965,
     E           156.11528,144.8054,133.95392,123.58582,
     F113.718237,104.36152,95.52015,87.193587,79.376966,
     G72.06184,65.2367,58.887572,52.9984686,47.551808,
     H42.52881,37.90981, -161.0632/
      DATA(CV(J),J=170,253) /0.,140.041,241.7578,315.905,369.836,
     1408.4535,435.1356,452.324,461.860,465.1824,463.4447,
     2457.5923,448.411361,436.5624,422.605038,407.015627,
     3390.20091,372.50863,354.23589,335.636035,316.924345,
     4298.2828,279.86423,261.79576,244.181955,227.107534,
     5210.63975,194.830534,179.7184,165.3302,151.682565,
     6138.78335,126.63286,115.22496,104.548064,94.586027,85.31896,
     776.723921,68.775566,61.4467093,54.7088, -190.5815,
     80.,169.0077,296.7693,392.5745,463.6425,515.336,551.629847,
     9575.52884,589.3607,594.9751,593.87034,587.2826,576.24395,
     A561.62441,544.163046,524.4901,503.14462,480.58799,
     B457.21499,433.36268,409.31784,385.32326,361.5831,338.26762,
     C315.51708,293.4455,272.14369,251.68218,232.113645,
     D213.47524,195.790561,179.07159,163.320123,148.529438,
     E134.68552,121.76827,109.75255,98.609121,88.30556,
     F78.806855,70.076204, -215.0803/
      DATA(CV(J),J=254,337) / 0.,193.17743,343.2791,458.4103,
     1545.3691,609.6051,655.4141,686.18934,704.64086,712.96486,
     2712.9661,706.14631,693.76751,676.89887,656.45138,633.204068,
     3607.82462,580.88566,552.87787,524.22084,495.27212,466.33486,
     4437.66445,409.47419,381.94032,355.20639,329.38722,304.57236,
     5280.82920,258.20579,236.73332,216.42839,197.295064,
     6179.326644,162.507347,146.813759,132.216142,118.679629,
     7106.165247,94.630848,84.031948, -235.7483, 0.,
     8213.6297,382.9529,515.1652,616.5969,692.5978,747.59323,
     9785.21641,808.45579,819.785125,821.268818,814.643585,
     A801.380843,782.73433,759.77703,733.42971,704.48372,673.61927,
     B641.42042,608.38749,574.94756,541.46333,508.24094,475.53657,
     C443.56235,412.49157,382.46326,353.58640,325.94349,299.5940,
     D274.57719,250.91497,228.61415,207.66872,188.06171,169.767033
     E,152.75096,136.973573,122.390001,108.951498,96.606471, -253.3707/
      DATA (CV(J),J=338,421) /0.,231.10177,417.02545,564.27041,
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305             6380.0505,332.1326,287.5827,246.3615,208.4034,173.6216,
                7141.91120,113.15276, -364.1723,
                80.,341.37215,634.4141,882.78515,1090.0806,1259.80603,
                91395.3562,1499.99726,1576.8533,1628.8952,1658.9329,1669.6101,
                A1663.4013,1642.6107,1609.3730,1565.6557,1513.2627,1453.839,
310             B1388.8761,1319.7186,1247.5707,1173.5042,1098.4650,1023.2820,
                C948.6743,875.2594,803.5610,734.0162,666.9812,602.74935,
                D541.53828,483.5121,428.7830,377.4174,329.4412,284.8452,
                E243.58975,205.6095,170.81724,139.10767,110.3610, -364.1847/
                 DATA (CV(J),J=1682,1764) / 0.,341.38431,634.43663,882.81456,
315             11090.11172,1259.8323,1395.3695,1499.98856,1576.8126,
                21628.81178,1658.79576,1669.4080,1663.1232,1642.2459,
                31608.9115,1565.0882,1512.5810,1453.0360,1387.9461,
                41318.6572,1246.3750,1172.17274,1096.9979,1021.68081,
                5946.94204,873.4004,801.58077,731.92154,664.7782,600.4485,
320             6539.14907,481.04448,426.2475,374.8247,326.8024,282.1713,
                7240.8919,202.8986,168.1039,136.40224,107.67329, -364.1762,
                80.,341.375555,634.41769,882.78260,1090.06260,1259.76063,
                91395.26890,1499.85169,1576.631,1628.5778,1658.5001,
                A1669.0418,1662.67770,1641.7127,1608.2827,1564.35686,1511.7408,
325             B1452.0818,1386.8736,1317.4636,1245.05872,1170.7333,
                C1095.4364,1019.99938,945.14408,871.49049,799.56450,
                D729.80553,662.5681,598.1548,536.7805,478.610416,423.75765,
                E372.2891,324.2312,279.5747,238.2800,200.2814,165.4911,
                F133.80316,105.0969/
330              END                                                        H51C037
```

```
      SYMBOLIC REFERENCE MAP (R=3)

VARIABLES      SN  TYPE            RELOCATION
    3  CV          REAL       ARRAY   BLK1         REFS        5   DEFINED       8       17       33       49       64
                                                     80       96       112     128      144      160      176      191
                                                    207      223       239     254      269      284      299      314
    1  DELTA       REAL       ARRAY   DBLK         REFS        4   DEFINED       7
```

```
      BLOCK DATA ADATA       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE      7

VARIABLES      SN  TYPE             RELOCATION
    0  DPR          REAL                  DBLK          REFS           4
    1  NW           INTEGER               BLK1          REFS           5   DEFINED        6
    0  NZ           INTEGER               BLK1          REFS           5   DEFINED        6
    2  VMA          REAL                  BLK1          REFS           5   DEFINED        6

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
      DBLK          11                0 DPR     (1)                 1 DELTA  (10)
      BLK1        1767                0 NZ      (1)                 1 NW     (1)                 2 VMA     (1)
                                      3 CV      (1764)

STATISTICS
  PROGRAM LENGTH                  0B       0
  CM LABELED COMMON LENGTH     3362B    1778
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                 74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420       09/02/77  13.54.00        PAGE      1

            SUBROUTINE ERN (N1, N2, N3)                                         H51B0169
      C
      C       C.C.ELLIS                                                         H51B002
      C     **PROGRAM TO PRINT ERROR NO., JOB NO., ETC. OFF AND/OR ON-LINE.     H51B003
      C     **ARGUMENT DEFINITION                                               H51B004
      C       N1--ERROR NUMBER.                                                 H51B005
      C           FIXED POINT INTEGER OF NOT MORE THAN 3 DIGITS.                H51B006
      C       N2--1 DIMENSIONAL ARRAY CONTAINING THE FOLLOWING.                 H51B007
      C           N2(1)--PROCEDURE CODE.                                        H51B008
      C                  3 HOLLERITH CHARACTERS, LEFT ADJUSTED.                 H51B009
      C           N2(2)--NAME OF SUBROUTINE                                     H51B010
      C                  6 HOLLERITH CHARACTERS OR LESS                         H51B011
      C           N2(3)--OFF-LINE, ON-LINE PRINT OPTION                         H51B012
      C                  N2(3)=1 PRINT OFF-LINE ONLY                            H51B013
      C                  N2(3)=2 PRINT ON-LINE ONLY                             H51B014
      C                  N2(3)=3 PRINT OFF-LINE AND ON-LINE                     H51B015
      C           N2(4)--CARD NO. OPTION                                        H51B0151
      C                  N2(4)=0 USE CARD NO. IN IS(4)                          H51B0152
      C                  N2(4) NOT =0 SET IS(4)=N2(4) AFTER CALL STATUS         H51B0153
      C                                                                         H51B0154
      C           N2(5)--ERN ENTRY COUNTER.                                     H51B0154
      C                  N2(5) IS INCREMENTED BY 1 EACH TIME ERN IS ENTERED.    H51B0155
      C                  N2(5) MUST BE INITIALIZED BY CALLING PROGRAM.          H51B0156
      C       N3--STATEMENT NO. OR SOME OTHER NUMERIC TO INDICATE STATEMENT     H51B0157
      C           FROM WHICH ERN WAS CALLED IN CALLING PROGRAM. N3 MUST BE A    H51B0158
      C           FIXED POINT INTEGER OF NOT MORE THAN 5 DIGITS.                H51B0159
      C                                                                         H51B016
      C                                                                         H51B017
            DIMENSION  N2(5)                                                    H51B018
      C                                                                         H51B0181
            N2(5) = N2(5) + 1                                                   H51B0199
            WRITE (6,900) N1,N2(1),N2(2),N3
            RETURN
        900 FORMAT(1IH0ERROR NO. ,I3,15H.    PROCEDURE ,A3,15H.   SUBROUTINE ,
           1A6,17H.  STATEMENT NO. ,I5)
            END                                                                 H51B037


    SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE       REFERENCES
    4  ERN             1            33

VARIABLES       SN  TYPE            RELOCATION
    0  N1           INTEGER              F.P.        REFS        32   DEFINED        1
    0  N2           INTEGER    ARRAY     F.P.        REFS        29        31      2*32   DEFINED        1        31
    0  N3           INTEGER              F.P.        REFS        32   DEFINED        1

FILE NAMES          MODE
      TAPE6         FMT                            WRITES        32

STATEMENT LABELS                DEF LINE    REFERENCES
   23  900        FMT               34          32
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          SUBROUTINE ERN         74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420       09/02/77  13.54.00        PAGE     2

      STATISTICS
        PROGRAM LENGTH                 358      29
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```
                    SUBROUTINE FINISH                                   H51F003
C
C                                                                       H51F004
C                                                                       H51F005
      COMMON /ABLK/ A                                                   H51F006
      COMMON /BBLK/ BIGX,BIGY,B                                         H51F007
      COMMON /DBLK/ DPR,DELTA(10)                                       H51F008
      COMMON /EBLK/ E                                                   H51F009
      COMMON /GBLK/ G,GAMMA(10),GPRINT(100,10)                          H51F011
      COMMON /HBLK/ H(10)                                               H51F012
      COMMON /IBLK/ ICM(10),ILH,ILD,ISG,INOG                            H51F013
      COMMON /NBLK/ NOG,NOH,NPT                                         H51F014
      COMMON /PBLK/ P,PI,PVMTST(10),PHIE                                H51F015
      COMMON /RBLK/ RPD,RZERO                                           H51F016
      COMMON /SBLK/ SIGMA(10)                                           H51F017
      COMMON /XBLK/ XK,XLA,XLB,XLC,XLD,XMU,XNA,XNB,XNC,XND,XNT,XOP3,XOP6H51F021
     1              ,ZP(100,10)                                         H51F022
      COMMON /YBLK/ YMN(10),WP(100,10)                                  H51F024
      WRITE (6,10) (ICM(I),I=1,10)                                      H51F027
   10 FORMAT(1H1,10X,10A6)                                              H51F028
      WRITE (6,20) H(ILH), XK, E, XMU, RZERO, DELTA(ILD)                H51F029
   20 FORMAT (1H0,10X,22HRUNWAY CHARACTERISTICS / 11X,3HH =,F8.3,       H51F030
     1 4H(IN),5X,3HK =,F8.1,11H(LBF/IN**3),5X,3HE =,F10.1 /             H51F031
     2 11X,4HMU =,F6.3,5X,4HRO =,F8.2,4H(IN),5X,7HDELTA =,F7.3 )        H51F032
      WRITE (6,30) XLA,XLB,XLC,XLD                                      H51F033
   30 FORMAT(1H0,10X, 4HGEAR /                                          H51F034
     1        1H ,10X,3HA =,F7.2,8H(IN) B =,F7.2,8H(IN) C =,F7.2,       H51F035
     2        8H(IN) D =,F7.2,4H(IN) )                                  H51F036
      WRITE (6,40) XNA,XNB,XNC,XND                                      H51F037
   40 FORMAT(1H ,10X,4HNA =,F5.1,6X,4HNB =,F5.1,6X,4HNC =,F5.1,6X,4HND =H51F038
     1 , F5.1 )                                                         H51F039
      WRITE (6,50) A,PHIE                                               H51F040
   50 FORMAT(1H0,10X,26HCONTACT AREA OF ONE TIRE =,F9.2,8H(SQ.IN.),     H51F041
     1 10X, 6HPHIE =,F5.3)                                              H51F042
      WRITE (6,60) P                                                    H51F043
   60 FORMAT(1H0, 10X,20HINFLATION PRESSURE =,F7.1,5H(PSI) )            H51F044
      WRITE (6,70) G,B                                                  H51F045
   70 FORMAT(1H0, 10X,11HGEAR LOAD =,F10.1,5H(LBF),10H      B =,F8.1//)H51F046
      DO 500 INOG = 1,NOG                                               H51F0465
      GAMMA(INOG) = GAMMA(INOG)*DPR                                     H51F048
      WRITE (6,90) INOG,GAMMA(INOG),PVMTST(INOG),YMN(INOG),SIGMA(INOG)  H51F049
   90 FORMAT(1H ,10X,6HGAMMA(,I2,3H) =,F8.3,9H(DEG) N =,F9.2,5H MN =,   H51F050
     1 F9.2,8H(IN.LB.) /                                                H51F051
     2 1H ,10X,17HPAVEMENT STRESS =,F11.3,5H(PSI)//)                    H51F052
  500 CONTINUE                                                          H51F053
  310 IF (XOP3 - 0.5) 160, 160, 110                                     H51F063
  110 WRITE (6,120)                                                     H51F064
  120 FORMAT (1H0,14X,1HZ,14X,1HW,10X,8HSUBTOTAL,10X,5HGAMMA)           H51F065
      DO 150 J=1,NOG                                                    H51F066
      DO 150 I=1,NPT                                                    H51F067
      WRITE (6,130) ZP(I,J),WP(I,J),GPRINT(I,J),GAMMA(J)                H51F068
  130 FORMAT ((10H          ,2(F10.4,5X),2(F10.3,5X)))                  H51F069
  150 CONTINUE                                                          H51F070
  160 CONTINUE                                                          H51F071
      DO 600 INOG = 1, NOG                                              H51F0725
  600 GAMMA(INOG) = GAMMA(INOG)*RPD                                     H51F0735
      RETURN                                                            H51F074
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           SUBROUTINE FINISH      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     2

                            END                                                                    MSIF075


       CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

           39     I                  CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.
           55     I                  CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.



           SYMBOLIC REFERENCE MAP (R=3)

        ENTRY POINTS      DEF LINE      REFERENCES
            2  FINISH          1         57

        VARIABLES      SN  TYPE            RELOCATION
            0  A           REAL                 ABLK        REFS          5        32
            2  B           REAL                 BBLK        REFS          6        37
            0  BIGX        REAL                 BBLK        REFS          6
            1  BIGY        REAL                 BBLK        REFS          6
            1  DELTA       REAL        ARRAY    DBLK        REFS          7        21
            0  DPR         REAL                 DBLK        REFS          7        40
            0  E           REAL                 EBLK        REFS          8        21
            0  G           REAL                 GBLK        REFS          9        37
            1  GAMMA       REAL        ARRAY    GBLK        REFS          9        40        41        51        56
                                                         DEFINED         40        56
           13  GPRINT      REAL        ARRAY    GBLK        REFS          9        51
            0  H           REAL        ARRAY    HBLK        REFS         10        21
          324  I           INTEGER                          REFS         19        3*51   DEFINED      19        50
            0  ICM         INTEGER     ARRAY    IBLK        REFS         11        19
           13  ILD         INTEGER              IBLK        REFS         11        21
           12  ILH         INTEGER              IBLK        REFS         11        21
           15  INOG        INTEGER              IBLK        REFS         11        2*40      5*41      2*56   DEFINED       39        55
           14  ISG         INTEGER              IBLK        REFS         11
          325  J           INTEGER                          REFS         4*51   DEFINED      49
            0  NOG         INTEGER              NBLK        REFS         12        39        49        55
            1  NOH         INTEGER              NBLK        REFS         12
            2  NPT         INTEGER              NBLK        REFS         12        50
            0  P           REAL                 PBLK        REFS         13        35
           14  PHIE        REAL                 PBLK        REFS         13        32
            1  PI          REAL                 PBLK        REFS         13
            2  PVMTST      REAL        ARRAY    PBLK        REFS         13        41
            0  RPD         REAL                 RBLK        REFS         14        56
            1  RZERO       REAL                 RBLK        REFS         14        21
            0  SIGMA       REAL        ARRAY    SBLK        REFS         15        41
           12  WP          REAL        ARRAY    YBLK        REFS         18        51
            0  XK          REAL                 XBLK        REFS         16        21
            1  XLA         REAL                 XBLK        REFS         16        25
            2  XLB         REAL                 XBLK        REFS         16        25
            3  XLC         REAL                 XBLK        REFS         16        25
            4  XLD         REAL                 XBLK        REFS         16        25
            5  XMU         REAL                 XBLK        REFS         16        21
            6  XNA         REAL                 XBLK        REFS         16        29
        SUBROUTINE FINISH      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE      3

  VARIABLES       SN  TYPE             RELOCATION
      7  XNB        REAL                   XBLK          REFS          16          29
     10  XNC        REAL                   XBLK          REFS          16          29
     11  XND        REAL                   XBLK          REFS          16          29
     12  XNT        REAL                   XBLK          REFS          16
     13  XOP3       REAL                   XBLK          REFS          16          46
     14  XOP6       REAL                   XBLK          REFS          16
      0  YMN        REAL          ARRAY    YBLK          REFS          18          41
     15  ZP         REAL          ARRAY    XBLK          REFS          16          51

  FILE NAMES         MODE
         TAPE6      FMT                       WRITES          19          21          25          29          32          35          37          41
                                                  47          51

  STATEMENT LABELS               DEF LINE   REFERENCES
    116  10         FMT              20          19
    132  20         FMT              22          21
    160  30         FMT              26          25
    201  40         FMT              30          29
    215  50         FMT              33          32
    231  60         FMT              36          35
    244  70         FMT              38          37
    263  90         FMT              42          41
      0  110            INACTIVE     47          46
    302  120        FMT              48          47
    316  130        FMT              52          51
      0  150                         53          49          50
    102  160                         54        2*46
      0  310            INACTIVE     46
      0  500                         45          39
      0  600                         56          55

  LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
     30  500     * INOG        39 45        17B                EXT REFS
     56  150     * J           49 53        23B                EXT REFS  NOT INNER
     60  150     * I           50 53        16B                EXT REFS
    104  600       INOG        55 56         5B      INSTACK

  COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
          ABLK           1                0 A        (1)
          BBLK           3                0 BIGX     (1)                  1 BIGY    (1)                  2 B       (1)
          DBLK          11                0 DPR      (1)                  1 DELTA   (10)
          EBLK           1                0 E        (1)
          GBLK        1011                0 G        (1)                  1 GAMMA   (10)                11 GPRINT  (1000)
          HBLK          10                0 H        (10)
          IBLK          14                0 ICM      (10)                10 ILH     (1)                 11 ILD     (1)
                                         12 ISG      (1)                 13 INOG    (1)
          NBLK           3                0 NOG      (1)                  1 NOH     (1)                  2 NPT     (1)
          PBLK          13                0 P        (1)                  1 PI      (1)                  2 PVMTST  (10)
                                         12 PHIE     (1)
          RBLK           2                0 RPD      (1)                  1 RZERO   (1)
          SBLK          10                0 SIGMA    (10)
          XBLK        1013                0 XK       (1)                  1 XLA     (1)                  2 XLB     (1)
                                          3 XLC      (1)                  4 XLD     (1)                  5 XMU     (1)
                                          6 XNA      (1)                  7 XNB     (1)                  8 XNC     (1)
                                          9 XND      (1)                 10 XNT     (1)                 11 XOP3    (1)
                                         12 XOP6     (1)                 13 ZP      (1000)
          YBLK        1010                0 YMN      (10)                10 WP      (1000)
        SUBROUTINE FINISH      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

  STATISTICS
    PROGRAM LENGTH                 326B     214
    CM LABELED COMMON LENGTH      6036B    3102
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```
SUBROUTINE GEOM       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     1

                                  SUBROUTINE GEOM                                   H51G003
      C
      C                                                                             H51G004
      C                                                                             H51G005
            COMMON /EBLK/ E,ER(100)                                                 H51G010
            COMMON /HBLK/ H(10)                                                     H51G013
            COMMON /IBLK/ ICM(10),ILH                                               H51G014
            COMMON /NBLK/ NOG,NOH,NPT,NX,NY,NOD,NOSG                                H51G015
            COMMON /RBLK/ RPD,RZERO                                                 H51G017
            COMMON /XBLK/ XK,XLA,XLB,XLC,XLD,XMU,XNA,XNB,XNC,XND,XNT,XOP3,XOP6H51G021
           1              ,ZP(100,10),XPZ(4097)                                     H51G022
            COMMON /YBLK/ YMN(10),WP(100,10) ,YPZ(4097)                             H51G025
            XLAR = XLA / RZERO                                                      H51G0272
            XLBR = XLB / RZERO                                                      H51G028
            XLCR = XLC / RZERO                                                      H51G029
            XLDR = XLD / RZERO                                                      H51G030
            WR = (XNA-1.) * XLAR + XNA*(XNB-1.)*XLBR                                H51G031
            XLR= (XNC-1.) * XLCR + XNC*(XND-1.)*XLDR                                H51G032
            NX = (XNA*XNB+1.) / 2.0 + 0.0001                                        H51G033
            NY = (XNC*XND+1.) / 2.0 + 0.0001                                        H51G034
            WR2= WR/2.                                                              H51G035
            ER(2) = XLAR-XLBR                                                       H51G036
            XLR2  = XLR/2.                                                          H51G037
            ER(5) = XLCR-XLDR                                                       H51G038
            N1    = XNB + 0.0001                                                    H51G039
            DO 10 I = 1,NX                                                          H51G040
            ER(3) = I - 1                                                           H51G041
            ER(I+50) = WR2 - ER(3)*XLBR - ER(2) * FLOAT ((I-1)/N1)                  H51G042
         10 CONTINUE                                                                H51G043
            N2 = XND + 0.0001                                                       H51G044
            DO 20 J = 1,NY                                                          H51G045
            ER(6) = J - 1                                                           H51G046
            ER(J+7) = XLR2 - ER(6)*XLDR - ER(5) * FLOAT ((J-1)/N2)                  H51G047
         20 CONTINUE                                                                H51G048
            NX1 = NX                                                                H51G049
            NY1 = NY                                                                H51G050
            IF ( ABS(ER(NX+50)) - 1.E-07 ) 30,30,40                                 H51G051
         30 ER(NX+50) = 0.                                                          H51G052
            NX1 = NX - 1                                                            H51G053
         40 NPT = 0                                                                 H51G054
            DO 60 J = 1,NY                                                          H51G055
            DO 50 I = 1,NX                                                          H51G056
            NPT = NPT + 1                                                           H51G057
            XPZ(NPT) = ER(I+50)                                                     H51G058
            YPZ(NPT) = ER(J+7 )                                                     H51G059
         50 CONTINUE                                                                H51G060
         60 CONTINUE                                                                H51G061
            IF ( ABS(ER(NY+7)) - 1.E-07 ) 70,70,75                                  H51G062
         70 ER(NY+7) = 0.                                                           H51G063
            NY1 =NY-1                                                               H51G064
         75 IF ( NY1 ) 105,105,80                                                   H51G065
         80 DO 100 J = 1,NY1                                                        H51G066
            DO 90  I = 1,NX                                                         H51G067
            NPT = NPT + 1                                                           H51G068
            XPZ(NPT) = ER(I+50)                                                     H51G069
            YPZ(NPT) =-ER(J+7)                                                      H51G070
         90 CONTINUE                                                                H51G071
      SUBROUTINE GEOM       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     2

                     100 CONTINUE                                                      H51G072
                     105 IF (NX1) 123,123,107                                          H51G073
 60                  107 DO 120 J = 1,NY                                               H51G074
                         DO 110 I = 1,NX1                                              H51G075
                         NPT = NPT + 1                                                 H51G076
                         XPZ(NPT) = -ER(I+50)                                          H51G077
                         YPZ(NPT) =  ER(J+7)                                           H51G078
 65                  110 CONTINUE                                                      H51G079
                     120 CONTINUE                                                      H51G080
                     123 IF (NX1) 145,145,125                                          H51G081
                     125 IF (NY1) 145,145,128                                          H51G082
                     128 DO 140 J = 1,NY1                                              H51G083
 70                      DO 130 I = 1,NX1                                              H51G084
                         NPT = NPT + 1                                                 H51G085
                         XPZ(NPT) = -ER(I+50)                                          H51G086
                         YPZ(NPT) = -ER(J+7)                                           H51G087
                     130 CONTINUE                                                      H51G088
 75                  140 CONTINUE                                                      H51G089
                     145 CONTINUE                                                      H51G100
                         RETURN                                                        H51G101
                         END                                                           H51G102


      SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE     REFERENCES
     2  GEOM            1          77

  VARIABLES      SN  TYPE             RELOCATION
     0  E            REAL                 EBLK      REFS        5
     1  ER           REAL        ARRAY    EBLK      REFS        5     2*28     2*33       37       44       45       48
                                                      55       56       63       64       72       73
                                                 DEFINED       22       24       27       28       32       33       38
                                                      49
     0  H            REAL        ARRAY    HBLK      REFS        6
   330  I            INTEGER                        REFS       27     2*28       44       55       63       72
                                                 DEFINED       26       42       53       61       70
     0  ICM          INTEGER     ARRAY    IBLK      REFS        7
    12  ILH          INTEGER              IBLK      REFS        7
   332  J            INTEGER                        REFS       32     2*33       45       56       64       73
                                                 DEFINED       31       41       52       60       69
     5  NOD          INTEGER              NBLK      REFS        8
     0  NOG          INTEGER              NBLK      REFS        8
     1  NOH          INTEGER              NBLK      REFS        8
     6  NOSG         INTEGER              NBLK      REFS        8
     2  NPT          INTEGER              NBLK      REFS        8       43       44       45       54       55       56
                                                      62       63       64       71       72       73
                                                 DEFINED       40       43       54       62       71
     3  NX           INTEGER              NBLK      REFS        8       26       35       37       38       39       42
                                                      53  DEFINED       19
   333  NX1          INTEGER                        REFS       59       61       67       70  DEFINED       35       39
     4  NY           INTEGER              NBLK      REFS        8       31       36       41       48       49       50
                                                      60  DEFINED       20
   334  NY1          INTEGER                        REFS       51       52       68       69  DEFINED       36       50
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      SUBROUTINE GEOM        74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00        PAGE     3

  VARIABLES       SN  TYPE            RELOCATION
    327  N1           INTEGER                            REFS        28   DEFINED      25
    331  N2           INTEGER                            REFS        33   DEFINED      30
      0  RPD          REAL                 RBLK          REFS         9
      1  RZERO        REAL                 RBLK          REFS         9      13        14        15        16
     12  WP           REAL        ARRAY    YBLK          REFS        12
    323  WR           REAL                               REFS        21   DEFINED      17
    325  WR2          REAL                               REFS        28   DEFINED      21
      0  XK           REAL                 XBLK          REFS        10
      1  XLA          REAL                 XBLK          REFS        10      13
    317  XLAR         REAL                               REFS        17      22   DEFINED      13
      2  XLB          REAL                 XBLK          REFS        10      14
    320  XLBR         REAL                               REFS        17      22        28   DEFINED      14
      3  XLC          REAL                 XBLK          REFS        10      15
    321  XLCR         REAL                               REFS        18      24   DEFINED      15
      4  XLD          REAL                 XBLK          REFS        10      16
    322  XLDR         REAL                               REFS        18      24        33   DEFINED      16
    324  XLR          REAL                               REFS        23   DEFINED      18
    326  XLR2         REAL                               REFS        33   DEFINED      23
      5  XMU          REAL                 XBLK          REFS        10
      6  XNA          REAL                 XBLK          REFS        10    2*17        19
      7  XNB          REAL                 XBLK          REFS        10      17        19        25
     10  XNC          REAL                 XBLK          REFS        10    2*18        20
     11  XND          REAL                 XBLK          REFS        10      18        20        30
     12  XNT          REAL                 XBLK          REFS        10
     13  XOP3         REAL                 XBLK          REFS        10
     14  XOP6         REAL                 XBLK          REFS        10
   1765  XPZ          REAL        ARRAY    XBLK          REFS        10   DEFINED      44        55        63        72
      0  YMN          REAL        ARRAY    YBLK          REFS        12
   1762  YPZ          REAL        ARRAY    YBLK          REFS        12   DEFINED      45        56        64        73
     15  ZP           REAL        ARRAY    XBLK          REFS        10

  INLINE FUNCTIONS    TYPE     ARGS         DEF LINE   REFERENCES
         ABS          REAL       1  INTRIN                 37        48
         FLOAT        REAL       1  INTRIN                 28        33

  STATEMENT LABELS                 DEF LINE     REFERENCES
      0  10                           29           26
      0  20                           34           31
      0  30           INACTIVE        38         2*37
    152  40                           40           37
      0  50                           46           42
      0  60                           47           41
      0  70           INACTIVE        49         2*48
    210  75                           51           48
      0  80           INACTIVE        52           51
      0  90                           57           53
      0  100                          58           52
    235  105                          59         2*51
      0  107          INACTIVE        60           59
      0  110                          65           61
      0  120                          66           60
    262  123                          67         2*59
      0  125          INACTIVE        68           67
      0  128          INACTIVE        69           68
      0  130                          74           70
      0  140                          75           69
    311  145                          76         2*67      2*68
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          SUBROUTINE GEOM        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     4

LOOPS  LABEL      INDEX        FROM-TO      LENGTH     PROPERTIES
   70  10          I            26 29         17B         OPT
  114  20          J            31 34         17B         OPT
  155  60        * J            41 47         20B                   NOT INNER
  157  50          I            42 46         13B         OPT
  214  100       * J            52 58         20B                   NOT INNER
  216  90          I            53 57         13B         OPT
  241  120       * J            60 66         20B                   NOT INNER
  243  110         I            61 65         13B         OPT
  270  140       * J            69 75         20B                   NOT INNER
  272  130         I            70 74         13B         OPT

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       EBLK         101                 0 E         (1)                 1 ER       (100)
       HBLK          10                 0 H         (10)
       IBLK          11                 0 ICM       (10)               10 ILH      (1)
       NBLK           7                 0 NOG       (1)                 1 NOH      (1)                 2 NPT      (1)
                                        3 NX        (1)                 4 NY       (1)                 5 NOD      (1)
                                        6 NOSG      (1)
       RBLK           2                 0 RPD       (1)                 1 RZERO    (1)
       XBLK        5110                 0 XK        (1)                 1 XLA      (1)                 2 XLB      (1)
                                        3 XLC       (1)                 4 XLD      (1)                 5 XMU      (1)
                                        6 XNA       (1)                 7 XNB      (1)                 8 XNC      (1)
                                        9 XND       (1)                10 XNT      (1)                11 XOP3     (1)
                                       12 XOP6      (1)                13 ZP       (1000)           1013 XPZ      (4097)
       YBLK        5107                 0 YMN       (10)               10 WP       (1000)           1010 YPZ      (4097)

STATISTICS
  PROGRAM LENGTH                335B     221
  CM LABELED COMMON LENGTH    24154B   10348
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SUBROUTINE OUTLNE     74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00         PAGE     1

                    SUBROUTINE OUTLNE                                   H510004
C                                                                       H510002
C                                                                       H510003
      DIMENSION DELTAR(10)
C                                                                       H510005
C                                                                       H510006
      COMMON /ABLK/ A,AP(10),AH(10),AK(10),ASIG(10),AG(10)              H510007
      COMMON /BBLK/ BIGX,BIGY,B                                         H510008
      COMMON /DBLK/ DPR,DELTA(10)                                       H510009
      COMMON /GBLK/ G,GAMMA(10),GPRINT(100,10)                          H510012
      COMMON /HBLK/ H(10)                                               H510013
      COMMON /IBLK/ ICM(10),ILH,ILD,ISG,INOG                            H510014
      COMMON /NBLK/ NOG,NOH,NPT,NX,NY,NOD,NOSG                          H510015
      COMMON/MIXBLK/STORE1(10,10),STORE2(10,10),COVRGD(10,20),IMIX,LR,JJ
      COMMON /PBLK/ P,PI,PVMTST(10),PHIE                                H510016
      COMMON /RBLK/ RPD,RZERO                                           H510017
      COMMON /SBLK/ SIGMA(10)                                           H510018
      COMMON /XBLK/ XK,XLA,XLB,XLC,XLD,XMU,XNA,XNB,XNC,XND,XNT,XOP3,XOP6H510021
     1              ,ZP(100,10),XPZ(4097)                               H510022
      COMMON /YBLK/ YMN(10),WP(100,10) ,YPZ(4097)                       H510025
      COMMON /BLK1/ NZ,NW,VMA,CV(1764)                                  H510027
      SAM(PX)=(1.+(PHIE-1.)*PX**3)*(SIN(PI*PX/2.))/PHIE                 H510028
      S = SQRT(A/(PI*PHIE))                                             H510029
      T = SQRT(A*PHIE/PI)                                              —H510030
      SR= S/RZERO                                                       H510031
      TR= T/RZERO                                                       H510032
      ILD = 1                                                           H510033
      IF (NOD .EQ. 0) GO TO 8                                           H510034
    7 DELTAR(ILD) = DELTA(ILD)/RZERO                                    H510035
    8 DO 50 K = 1,10                                                    H510036
      PVMTST(K) = 0.0                                                   H510037
      DO 51 J = 1,100                                                   H510038
      GPRINT(J,K) = 0.0                                                 H510039
   51 CONTINUE                                                          H510040
   50 CONTINUE                                                          H510041
      DO 305 INOG=1,NOG                                                 H510042
      IF (XOP6 .EQ. 1. ) GO TO 10                                       H510043
      IF (GAMMA(INOG) .EQ. 0.) GO TO 20                                 H510044
      IF ( ABS(GAMMA(INOG) - 90.*RPD) .LT. 1.0E-7 ) GO TO 30            H510045
      XZEROP = -(XPZ(1) + SR*TAN(GAMMA(INOG))/SQRT((TAN(GAMMA(INOG)))**2H510046
     1 + PHIE**2)  + DELTAR(ILD)*COS(GAMMA(INOG)))                      H510047
      YZEROP = -(YPZ(1) + TR*PHIE/SQRT( (TAN(GAMMA(INOG)))**2 +         H510048
     1 PHIE**2) - DELTAR(ILD) * SIN(GAMMA(INOG)))                       H510049
      GO TO 40                                                          H510050
   10 XZEROP = BIGX/RZERO                                               H510051
      YZEROP = BIGY/RZERO                                               H510052
      GO TO 40                                                          H510053
   20 XZEROP = -(DELTAR(ILD) + XPZ(NX))                                 H510054
      YZEROP = -(YPZ(1) + TR)                                           H510055
      GO TO 40                                                          H510056
   30 XZEROP = -(XPZ(1) + SR)                                           H510057
      YZEROP = (DELTAR(ILD) + YPZ(NY))                                  H510058
   40 M = B/4.0 + 0.99999999                                            H510059
      KBP= 4*M                                                          H510060
C                   START LOOP ON TIRE POINTS                           H510061
      DO 250 IPT = 1,NPT                                                H510062
      NE=0
      NT= 0
      XZERO=XPZ(IPT) + SR - XZEROP                                      H510063
      YZERO=YPZ(IPT) - YZEROP                                           H510064
      ZZERO=XZERO*COS(GAMMA(INOG))-YZERO*SIN(GAMMA(INOG))               H510065
      WZERO=XZERO*SIN(GAMMA(INOG))+YZERO*COS(GAMMA(INOG))               H510066
C                   START LOOP ON TIRE PERIMETER                        H510067
      DM = M                                                            H510069
      DO 200 J=1,KBP                                                    H510068
      DJ = J                                                            H510070
      IF(1.LE.J .AND. J.LE.M) GO TO 60                                  H510071
      IF(M+1.LE.J .AND. J.LE.2*M) GO TO 70                              H510072
      IF(2*M+1.LE.J .AND. J.LE.3*M) GO TO 80                            H510073
      PX = (4.*DM-DJ)/DM                                                H510074
      XI=XPZ(IPT)-XZEROP+SR*SQRT(1.-SAM(PX)**2)                         H510075
      YI=YPZ(IPT)-YZEROP-TR*SAM(PX)                                     H510076
      GO TO 90                                                          H510077
   60 PX = (DJ/DM)                                                      H510078
      XI=XPZ(IPT)-XZEROP+SR*SQRT(1.-SAM(PX)**2)                         H510079
      YI=YPZ(IPT)-YZEROP+TR*SAM(PX)                                     H510080
      GO TO 90                                                          H510081
   70 PX = (2.*DM-DJ)/DM                                                H510082
      XI=XPZ(IPT)-XZEROP-SR*SQRT(1.-SAM(PX)**2)                         H510083
      YI=YPZ(IPT)-YZEROP+TR*SAM(PX)                                     H510084
      GO TO 90                                                          H510085
   80 PX = (DJ-2.*DM)/DM                                                H510086
      XI=XPZ(IPT)-XZEROP-SR*SQRT(1.-SAM(PX)**2)                         H510087
      YI=YPZ(IPT)-YZEROP-TR*SAM(PX)                                     H510088
   90 ZI=XI*COS(GAMMA(INOG))-YI*SIN(GAMMA(INOG))                        H510089
      WI=XI*SIN(GAMMA(INOG))+YI*COS(GAMMA(INOG))                        H510090
      ZINT = (ZI + ZZERO) / 2.0                                         H510091
      IF(ABS(ZINT) .LE. VMA) GO TO 395
      IF(J .GT. 1) GO TO 385
      AZINT=          COS(GAMMA(INOG))*(XPZ(IPT)-XZEROP) - SIN(GAMMA(INOG)H510136
     1 )*(YPZ(IPT)-YZEROP)                                              H510137
      IF(AZINT-T .LT. VMA) GO TO 385
      NE= KBP
      GO TO 215
 385  AZINT= VMA
      IF(ZINT .GT. 0.0) ZINT= AZINT
      GO TO 397
 395  AZINT= ZINT
      IF (ZINT .LT. 0.0) AZINT= -ZINT                                   H510092
 397  WL= WI
      IF(WI.GT.VMA.AND.WZERO.LE.VMA) GO TO 410
      IF(WI.LE.VMA.AND.WZERO.GT.VMA) GO TO 415
      GO TO 420
 415  WZERO= VMA
      GO TO 418
 410  WI= VMA
 418  NT= 1
 420  CALL TABINT (AZINT, TNA, WI, NZ, NW, CV, IND)                     H510107
      IF (IND.LT.2) GO TO 120                                           H510109
      TNA = 0.0                                                         H510113
      IF (ABS(WI) .GT. 1.0E-05) NT=NT+2                                 H5101095
  120 CALL TABINT (AZINT, TNB, WZERO, NZ, NW, CV, IND)                  H510114
      IF (IND .GT. 1) GO TO 125                                         H510116
      IF(NT .GT. 1) GO TO 127
      GO TO 130
  125 TNB = 0.0                                                          H510120
      IF (ABS(WZERO) .LT. 1.0E-05) GO TO 130                             H5101165
      IF(NT .GT. 1) GO TO 196
      NT=NT+1
  127 WRITE(6.193)
  193 FORMAT(*0++++++W A R N I N G.  UNEXPECTED COORDINATE FOR TIRE PRIN
     1T.  PLEASE CHECK FOR ERROR.*)
  130 TANS=TNA-TNB                                                       H510121
      IF(AZINT .NE. ZINT) TANS=-TANS
      GPRINT(IPT,INOG) = GPRINT(IPT,INOG) + TANS                         H510128
      XZERO=XI                                                           H510129
      YZERO=YI                                                           H510130
      ZZERO=ZI                                                           H510131
      WZERO=WL
      IF(NT .EQ. 0)  GO TO 200
  196 NE= NE+1
      NT= 0
      IF(NE .GT. 9) GO TO 200
      IF(NE.EQ.1) WRITE(6,400)
  400 FORMAT(1H1)
      WRITE (6,191) AZINT, WI, WZERO
  191 FORMAT (1H0,32HDATA IS OUTSIDE LIMITS OF TABLE. /4X,7HAZINT =,     H510111
     1 F15.7,5X,4HWI =,F15.7,5X,7HWZERO =,F15.7)
  200 CONTINUE                                                           H510133
      IF(NE.GE.KBP) GPRINT(IPT,INOG)=0.0
  215 IF(NE.GT. 9) WRITE(6,401) NE,IPT
  401 FORMAT(11H0A TOTAL OF ,I5,55H POINTS WERE OUTSIDE THE LIMITS OF TA
     1BLE FOR WHEEL LOAD ,I5)
      PVMTST(INOG) = PVMTST(INOG) + GPRINT(IPT,INOG)                     H510134
      IF (XOP3 - 0.5) 250,250,230                                        H510135
  230 ZP(IPT,INOG)= COS(GAMMA(INOG))*(XPZ(IPT)-XZEROP) - SIN(GAMMA(INOG)H510136
     1 )*(YPZ(IPT)-YZEROP)                                               H510137
      WP(IPT,INOG)= SIN(GAMMA(INOG))*(XPZ(IPT)-XZEROP) + COS(GAMMA(INOG)H510138
     1 )*(YPZ(IPT)-YZEROP)                                               H510139
  250 CONTINUE                                                           H510140
      YMN(INOG)=RZERO*RZERO/10000.0*P*PVMTST(INOG)                       H510141
      SIGMA(INOG)=6.0*YMN(INOG)/H(ILH)**2                                H510142
      IF(LR.EQ.1) STORE1(JJ,ILH)=SIGMA(INOG)
      IF(LR.EQ.2) STORE2(JJ,ILH)=SIGMA(INOG)
      IF (NOSG .EQ. 0) GO TO 305                                         H513143
      DO 280 ISG=1,NOSG                                                  H510144
      AP(ISG)= AG(ISG)/(XNT*A)                                           H510145
      AH(ISG)=RZERO*SQRT(ABS((6.0*AP(ISG)*PVMTST(INOG))/(10000.*ASIG     H510146
     1 (ISG))))                                                          H510147
      AK(ISG) = (34.1/AH(ISG))*(10.0*AH(ISG)/RZERO)**4                   H510148
  280 CONTINUE                                                           H510149
      CALL CURVE                                                         H510150
  305 CONTINUE                                                           H510151
      CALL FINISH                                                        H510152
      IF (NOD .EQ. 0) GO TO 320                                          H510153
      ILD = ILD + 1                                                      H510154
      IF (ILD .LE. NOD) GO TO 7                                          H510155
  320 RETURN                                                             H510156
      END                                                                H510157
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        SUBROUTINE OUTLNE     74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00       PAGE     4
CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      36    I               CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.
     156    I               CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.


        SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS     DEF LINE     REFERENCES
     2  OUTLNE           1       168

 VARIABLES     SN  TYPE            RELOCATION
     0  A         REAL                ABLK          REFS         7        23        24       157
    51  AG        REAL       ARRAY    ABLK          REFS         7       157
    13  AH        REAL       ARRAY    ABLK          REFS         7     2*160   DEFINED       158
    25  AK        REAL       ARRAY    ABLK          REFS         7   DEFINED       160
     1  AP        REAL       ARRAY    ABLK          REFS         7       158   DEFINED       157
    37  ASIG      REAL       ARRAY    ABLK          REFS         7       158
  1317  AZINT     REAL                              REFS        92        96       108       112       124       136
                                                 DEFINED        90        95        98        99
     2  B         REAL                BBLK          REFS         8        53
     0  BIGX      REAL                BBLK          REFS         8        45
     1  BIGY      REAL                BBLK          REFS         8        46
   310  COVRGD    REAL       ARRAY    MIXBLK        REFS        14
     3  CV        REAL       ARRAY    BLK1          REFS        21       108       112
     1  DELTA     REAL       ARRAY    DBLK          REFS         9        29
  1325  DELTAR    REAL       ARRAY                  REFS         4        40        42        48        52
                                                 DEFINED        29
  1310  DJ        REAL                              REFS        70        74        78        82   DEFINED        66
  1307  DM        REAL                              REFS      2*70        74      2*78      2*82   DEFINED        64
     0  DPR       REAL                DBLK          REFS         9
     0  G         REAL                GBLK          REFS        10
     1  GAMMA     REAL       ARRAY    GBLK          REFS        10        38        39      3*40      2*42      2*61      2*62
                                                    2*85      2*86      2*90     2*146     2*148
    13  GPRINT    REAL       ARRAY    GBLK          REFS        10       125       144   DEFINED        33       125       140
     0  H         REAL       ARRAY    HBLK          REFS        11       152
     0  ICM       INTEGER    ARRAY    IBLK          REFS        12
    13  ILO       INTEGER             IBLK          REFS        12      2*29        40        42        48        52       166
                                                     167   DEFINED        27       166
    12  ILH       INTEGER             IBLK          REFS        12       152       153       154
   620  IMIX      INTEGER             MIXBLK        REFS        14
  1322  IND       INTEGER                           REFS       108       109       112       113
    15  INOG      INTEGER             IBLK          REFS        12        38        39      3*40      2*42      2*61      2*62
                                                    2*85      2*86      2*90     2*125       140     3*144     3*146     3*148
                                                   2*151     2*152       153       154       158   DEFINED        36
  1300  IPT       INTEGER                           REFS        59        60        71        72        75        76        79
                                                      80        83        84      2*90     2*125       140       141       144
                                                   3*146     3*148   DEFINED        56
    14  ISG       INTEGER             IBLK          REFS        12     2*157     3*158     3*160   DEFINED       156
  1273  J         INTEGER                           REFS        33        66      2*67      2*68      2*69        89
                                                 DEFINED        32        65
   622  JJ        INTEGER             MIXBLK        REFS        14       153       154
  1272  K         INTEGER                           REFS        31        33   DEFINED        30
  1277  KBP       INTEGER                           REFS        65        93       140   DEFINED        54
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       SUBROUTINE OUTLNE     74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE     5

VARIABLES     SN  TYPE           RELOCATION
  621  LR        INTEGER             MIXBLK       REFS        14       153       154
 1276  M         INTEGER                          REFS        54        64        67      2*68      2*69
                                               DEFINED        53
 1301  NE        INTEGER                          REFS       131       133       134       140     2*141
                                               DEFINED        57        93       131
    5  NOD       INTEGER             NBLK         REFS        13        28       165       167
    0  NOG       INTEGER             NBLK         REFS        13        36
    1  NOH       INTEGER             NBLK         REFS        13
    6  NOSG      INTEGER             NBLK         REFS        13       155       156
    2  NPT       INTEGER             NBLK         REFS        13        56
 1302  NT        INTEGER                          REFS       111       114       118       119       130
                                               DEFINED        58       107       111       119       132
    1  NW        INTEGER             BLK1         REFS        21       108       112
    3  NX        INTEGER             NBLK         REFS        13        48
    4  NY        INTEGER             NBLK         REFS        13        52
    0  NZ        INTEGER             BLK1         REFS        21       108       112
    0  P         REAL                PBLK         REFS        15       151
   14  PHIE      REAL                PBLK         REFS        15        23        24        40      2*42      2*71      2*72
                                                  2*75      2*76      2*79      2*80      2*83      2*84
    1  PI        REAL                PBLK         REFS        15        23        24        71        72        75        76
                                                    79        80        83        84
    2  PVMTST    REAL       ARRAY    PBLK         REFS        15       144       151       158   DEFINED        31       144
 1311  PX        REAL                             REFS      2*71      2*72      2*75      2*76      2*79      2*80      2*83
                                                  2*84   DEFINED        70        74        78        82
    0  RPD       REAL                RBLK         REFS        16        39
    1  RZERO     REAL                RBLK         REFS        16        25        26        29        45        46     2*151
                                                   158       160
 1266  S         REAL                             REFS        25   DEFINED        23
    0  SIGMA     REAL       ARRAY    SBLK         REFS        17       153       154   DEFINED       152
 1270  SR        REAL                             REFS        40        51        59        71        75        79        83
                                               DEFINED        25
    0  STORE1    REAL       ARRAY    MIXBLK       REFS        14   DEFINED       153
  144  STORE2    REAL       ARRAY    MIXBLK       REFS        14   DEFINED       154
 1267  T         REAL                             REFS        26        92   DEFINED        24
 1324  TANS      REAL                             REFS       124       125   DEFINED       123       124
 1321  TNA       REAL                             REFS       108       123   DEFINED       110
 1323  TNB       REAL                             REFS       112       123   DEFINED       116
 1271  TR        REAL                             REFS        42        49        72        76        80        84
                                               DEFINED        26
    2  VMA       REAL                BLK1         REFS        21        88        92        95     2*101     2*102       104
                                                   106
 1315  WI        REAL                             REFS       100       101       102       108       111       136
                                               DEFINED        86       106
 1320  WL        REAL                             REFS       129   DEFINED       100
   12  WP        REAL       ARRAY    YBLK         REFS        20   DEFINED       148
 1306  WZERO     REAL                             REFS       101       102       112       117       136
                                               DEFINED        62       104       129
 1312  XI        REAL                             REFS        85        86       126   DEFINED        71        75        79
                                                    83
    0  XK        REAL                XBLK         REFS        18
    1  XLA       REAL                XBLK         REFS        18
    2  XLB       REAL                XBLK         REFS        18
    3  XLC       REAL                XBLK         REFS        18
    4  XLD       REAL                XBLK         REFS        18
    5  XMU       REAL                XBLK         REFS        18
    6  XNA       REAL                XBLK         REFS        18
    7  XNB       REAL                XBLK         REFS        18
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       SUBROUTINE OUTLNE     74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00       PAGE     6

VARIABLES     SN  TYPE           RELOCATION
   10  XNC       REAL                XBLK         REFS        18
   11  XND       REAL                XBLK         REFS        18
   12  XNT       REAL                XBLK         REFS        18       157
   13  XOP3      REAL                XBLK         REFS        18       145
   14  XOP6      REAL                XBLK         REFS        18        37
 1765  XPZ       REAL       ARRAY    XBLK         REFS        18        40        48        51        59        71        75
                                                    79        83        90       146       148
 1303  XZERO     REAL                             REFS        61        62   DEFINED        59       126
 1274  XZEROP    REAL                             REFS        59        71        75        79        83        90       146
                                                   148   DEFINED        40        45        48        51
 1313  YI        REAL                             REFS        85        86       127   DEFINED        72        76        80
                                                    84
    0  YMN       REAL       ARRAY    YBLK         REFS        20       152   DEFINED       151
 1762  YPZ       REAL       ARRAY    YBLK         REFS        20        42        49        52        60        72        76
                                                    80        84        90       146       148
 1304  YZERO     REAL                             REFS        61        62   DEFINED        60       127
 1275  YZEROP    REAL                             REFS        60        72        76        80        84        90       146
                                                   148   DEFINED        42        46        49        52
 1314  ZI        REAL                             REFS        87       128   DEFINED        85
 1316  ZINT      REAL                             REFS        88        96        98      2*99       124
                                               DEFINED        87        96
   15  ZP        REAL       ARRAY    XBLK         REFS        18   DEFINED       146
 1305  ZZERO     REAL                             REFS        87   DEFINED        61       128

FILE NAMES        MODE
       TAPE6     FMT                    WRITES     120       134       136       141

EXTERNALS          TYPE   ARGS       REFERENCES
       COS       REAL       1 LIBRARY      40        61        62        85        86        90       146       148
       CURVE                0            162
       FINISH               0            164
       SIN       REAL       1 LIBRARY      42        61        62        71        72        75        76        79        80
                                           83        84        85        86        90       146       148
       SQRT      REAL       1 LIBRARY      23        24        40        42        71        75        79        83       158
       TABINT               7            108       112
       TAN       REAL       1 LIBRARY    2*40        42

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       ABS       REAL       1  INTRIN                39        88       111       117       158
       SAM       REAL       1    SF            22        71        72        75        76        79        80        83        84

STATEMENT LABELS             DEF LINE   REFERENCES
   32  7                         29       167
   36  8                         30        28
  144  10                        45        37
  153  20                        48        38
  164  30                        51        39
  174  40                        53        44        47        50
    0  50                        35        30
    0  51                        34        32
  335  60                        74        67
  376  70                        78        68
  440  80                        82        69
  501  90                        85        73        77        81
  647  120                      112       109
  661  125                      116       113
  674  127                      120       114
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          SUBROUTINE OUTLNE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00        PAGE      7

   STATEMENT LABELS                 DEF LINE    REFERENCES
    677  130                           123         115          117
   1220  191       FMT                 137         136
   1172  193       FMT                 121         120
    725  196                           131         118
    743  200                           139          65          130          133
    755  215                           141          94
      0  230            INACTIVE       146         145
   1030  250                           150          56         2*145
      0  280                           161         156
   1120  305                           163          36          155
   1135  320                           168         165
    567  385                            95          89           92
    577  395                            98          88
    605  397                           100          97
   1210  400       FMT                 135         134
   1237  401       FMT                 142         141
    625  410                           106         101
    621  415                           104         102
    630  418                           107         105
    632  420                           108         103

   LOOPS  LABEL     INDEX       FROM-TO      LENGTH      PROPERTIES
     37   50      * K             30 35         16B                 NOT INNER
     43   51        J             32 34          7B        INSTACK
     57   305     * INOG          36 163      1044B                 EXT REFS  NOT INNER
    204   250     * IPT           56 150       627B                 EXT REFS  NOT INNER
    251   200     * J             65 139       475B                 EXT REFS    EXITS
   1067   280     * ISG          156 161        26B                 EXT REFS

   COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
          ABLK         51                   0 A        (1)                   1 AP       (10)                11 AH       (10)
                                           21 AK       (10)                 31 ASIG     (10)                41 AG       (10)
          BBLK          3                   0 BIGX     (1)                   1 BIGY     (1)                  2 B        (1)
          DBLK         11                   0 DPR      (1)                   1 DELTA    (10)
          GBLK       1011                   0 G        (1)                   1 GAMMA    (10)                11 GPRINT   (1000)
          HBLK         10                   0 H        (10)
          IBLK         14                   0 ICM      (10)                 10 ILH      (1)                 11 ILD      (1)
                                           12 ISG      (1)                  13 INOG     (1)
          NBLK          7                   0 NOG      (1)                   1 NOH      (1)                  2 NPT      (1)
                                            3 NX       (1)                   4 NY       (1)                  5 NOD      (1)
                                            6 NOSG     (1)
          MIXBLK      403                   0 STORE1   (100)               100 STORE2   (100)              200 COVRGD   (200)
                                          400 IMIX     (1)                 401 LR       (1)                402 JJ       (1)
          PBLK         13                   0 P        (1)                   1 PI       (1)                  2 PVMTST   (10)
                                           12 PHIE     (1)
          RBLK          2                   0 RPD      (1)                   1 RZERO    (1)
          SBLK         10                   0 SIGMA    (10)
          XBLK       5110                   0 XK       (1)                   1 XLA      (1)                  2 XLB      (1)
                                            3 XLC      (1)                   4 XLD      (1)                  5 XMU      (1)
                                            6 XNA      (1)                   7 XNB      (1)                  8 XNC      (1)
                                            9 XND      (1)                  10 XNT      (1)                 11 XOP3     (1)
                                           12 XOP6     (1)                  13 ZP       (1000)            1013 XPZ      (4097)
          YBLK       5107                   0 YMN      (10)                 10 WP       (1000)            1010 YPZ      (4097)
          BLK1       1767                   0 NZ       (1)                   1 NW       (1)                  2 VMA      (1)
                                            3 CV       (1764)
      SUBROUTINE OUTLNE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00         PAGE     8

   STATISTICS
     PROGRAM LENGTH              1337B      735
     CM LABELED COMMON LENGTH   32317B    13519
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                                  SUBROUTINE PROBRD                       H51P004
      C
      C                                                                   H51P003
            DIMENSION KERN(5)                                             H51P004
      C                                                                   H51P005
      C                                                                   H51P006
            COMMON /ABLK/ A.AP(10).AH(10).AK(10).ASIG(10).AG(10)          H51P007
            COMMON /BBLK/ BIGX.BIGY.B                                     H51P008
            COMMON /TYPBK/ LMH.LFUNC
            COMMON /DBLK/ DPR.DELTA(10)                                   H51P009
            COMMON /EBLK/ E.ERX(50).ERY(50)                               H51P010
            COMMON /GBLK/ G.GAMMA(10).GPRINT(100.10)                      H51P012
            COMMON /HBLK/ H(10)                                           H51P013
            COMMON /IBLK/ ICM(10)                                         H51P014
            COMMON/NBLK/ NOG.NOH.NPT.NX.NY.NOD.NOSG.XXK
            COMMON /PBLK/ P,PI.PVMTST(10).PHIE                            H51P016
            COMMON /RBLK/ RPD.RZERO                                       H51P017
            COMMON /XBLK/ XK.XLA.XLB.XLC.XLD.XMU.XNA.XNB.XNC.XND.XNT.XOP3.XOP6H51P021
            DATA KERN / 3HH51.6HPROBRD.1.0.0 /                            H51P028
            REWIND 7
            PI = 3.1415927                                                H51P030
            DPR= 180.0/PI                                                 H51P031
            RPD= PI/180.0                                                 H51P032
            READ (7.10) (ICM(I).I=1.10)                                   H51P033
         10 FORMAT ( 10A6 )                                               H51P034
            WRITE (6.20)                                                  H51P035
         20 FORMAT(1H1 .19X.35HP R O B L E M   I N P U T   D A T A   )    H51P036
            WRITE (6.30) (ICM(I).I=1.10)                                  H51P037
         30 FORMAT (1H0. 11X. 10A6 )                                      H51P038
       8990 READ (7.40)      G. P. A.         XNOG                        H51P039
            G=.75*G
            IF(LFUNC.EQ.3) G=.75*G
      C      GROSS LOAD REDUCED TO ALLOW FOR LOAD TRANSFER ACCROSS JOINT.
       1000 FORMAT(1H0.3X.57HLOAD REDUCED 25% TO ALLOW FOR LOAD TRANSFER ACCRO
           1SS JOINT)
            WRITE(6.1000)
            XK=XXK
            XNOH=NOH
         40 FORMAT (6F10.0)                                               H51P040
            IF (XNOH) 200. 200. 210                                       H51P041
        200 CALL ERN (01. KERN. 200)                                      H51P042
            GO TO 8990                                                    H51P043
        210 IF (XNOH - 10.) 211. 211. 205                                 H51P044
        205 CALL ERN (02. KERN. 205)                                      H51P045
            GO TO 8990                                                    H51P046
        211 IF (XNOG) 220. 220. 225                                       H51P047
        220 CALL ERN (03. KERN. 220)                                      H51P048
            GO TO 8990                                                    H51P049
        225 IF (XNOG - 10.) 230. 230. 215                                 H51P050
        215 CALL ERN (04. KERN. 215)                                      H51P051
            GO TO 8990                                                    H51P052
        230 IF (P.EQ.0.0.AND.A.EQ.0.0) GO TO 240                          H51P053
            WRITE (6.45)                                                  H51P054
         45 FORMAT (1H0.3X.11HK(LB/CU IN).5X.5HG(LB).8X.6HP(PSI).6X.8HA(SQ IN)H51P055
           1.4X. 8HNO. H(I).2X.12HNO. GAMMA(I) )                          H51P056
            WRITE (6.50) XK. G. P. A. XNOH. XNOG                          H51P057
         50 FORMAT (1H .5X.F7.1.5X.F10.1.5X.F7.1.5X.F9.1.2(5X.F4.1) )     H51P058
      GO TO 245                                                         H51P059
  240 CALL ERN(05, KERN, 240)                                           H51P060
      GO TO 8990                                                        H51P061
  245 READ (7,40) XLA, XLB, XLC, XLD, XNOD, XNOSG                       H51P062
      IF (XNOD) 250, 255, 255                                           H51P063
  250 CALL ERN (06, KERN, 250)                                          H51P064
      GO TO 8990                                                        H51P065
  255 IF (XNOD - 10.) 265, 265, 260                                     H51P066
  260 CALL ERN (07, KERN, 260)                                          H51P067
      GO TO 8990                                                        H51P068
  265 IF (XNOSG) 270, 275, 275                                          H51P069
  270 CALL ERN (08, KERN, 270)                                          H51P070
      GO TO 8990                                                        H51P071
  275 IF (XNOSG - 10.) 285, 285, 280                                    H51P072
  280 CALL ERN (09, KERN, 280)                                          H51P073
      GO TO 8990                                                        H51P074
  285 WRITE (6,60)                                                      H51P075
   60 FORMAT (1H0,3X,50HSMALL A(IN)  SMALL B(IN)  SMALL C(IN)  SMALL D(IH51P076
     1N),22H NO. DELTA(I) NO.(S,G) )                                    H51P077
      NOG = XNOG + 0.0001                                               H51P078
      NOD=XNOD+0.0001                                                   H51P079
      NOSG=XNOSG+0.0001                                                 H51P080
      NOH = XNOH + 0.0001                                               H51P0801
      WRITE (6,65) XLA,XLB,XLC,XLD,XNOD,XNOSG                           H51P0802
   65 FORMAT (1H ,5X,F7.2,3(5X,F7.2),7X,F4.1,5X,F4.1)                   H51P0803
      READ (7,40) XNA, XNB, XNC, XND, PHIE, XOP3                        H51P0804
      IF (PHIE.EQ.0.0) PHIE = 5./3.                                     H51P0805
      WRITE (6,70)         XNA,XNB,XNC,XND,PHIE                         H51P081
   70 FORMAT (1H0,5X,3HXNA,9X,3HXNB,9X,3HXNC,9X,3HXND,9X,6HPHI(E)/      H51P082
     11H ,4X,F4.1,4(8X,F4.1))                                           H51P083
      NPT= XOP3+0.0001
      IF(NPT .LE. 0) GO TO 73
      READ (7,42)  (ERX(I),ERY(I),I=1,NPT)
      WRITE(6,43)  (ERX(I),ERY(I),I=1,NPT)
 43   FORMAT(1H0,23X,22HXPZ(I),    YPZ(I) (IN) ,/,10F11.2)
      NX=NY= 1
 73   READ (7,40) B, XOP3, BIGX, BIGY, XOP6                             H51P084
      WRITE (6,75) B, XOP3, BIGX, BIGY, XOP6                            H51P085
   75 FORMAT (1H0,8X,1HB,6X,9HPRINT OPT,3X,5HBIG X,7X,5HBIG Y,6X,       H51P086
     18HCOOR OPT /1H ,5X,F7.1,5X,F4.1,2(5X,F7.2),7X,F4.1 )              H51P087
   42 FORMAT (10F6.0)                                                   H51P0885
      WRITE (6,80) (H(I),I=1,NOH)                                       H51P089
   80 FORMAT (1H0,30X,9HH(I) (IN) /                                     H51P090
     11H ,2X,6(F7.2,4X) )                                               H51P091
      READ (7,42) (GAMMA(I), I=1,NOG)                                   H51P092
      WRITE (6,85) (GAMMA(I), I=1,NOG)                                  H51P093
   85 FORMAT (1H0,27X,14HGAMMA(I) (DEG)/                                H51P094
     11H ,2X,6(F7.2,4X) )                                               H51P095
      IF (NOD.EQ.0) GO TO 97                                            H51P0951
      READ (7,42) (DELTA(I), I=1,NOD)                                   H51P096
      WRITE (6,90) (DELTA(I), I=1,NOD)                                  H51P097
   90 FORMAT (1H0,30X,8HDELTA(I) /                                      H51P098
     11H ,2X,6(F7.2,4X) )                                               H51P099
   97 IF (NOSG .EQ. 0) GO TO 99                                         H51P0995
      READ (7,92) (ASIG(I), AG(I), I=1,NOSG)                            H51P100
   92 FORMAT (2F10.0)                                                   H51P1001
      WRITE (6,95) ( ASIG(I),AG(I), I=1,NOSG)                           H51P1002
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       SUBROUTINE PROBRD      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00        PAGE     3

 115             95 FORMAT (1H0,6X,7HASIG(I),9X,5HAG(I) /    2(5X,F10.1)/)               H51P101
                 99 DO 300 I = 1,NOG                                                     H51P105
                    GAMMA(I) = GAMMA(I)*RPD                                              H51P106
                300 CONTINUE                                                             H51P107
                    XNT=XNA*XNB*XNC*XND                                                  H51P113
 120                IF(NPT .GT. 0) XNT= NPT
                    IF (XNT - 4096.001) 410, 400, 400                                    H51P114
                400 CALL ERN (10, KERN, 400)                                             H51P115
                    GO TO 8990                                                           H51P1151
                410 IF (A) 490, 500, 490                                                 H51P116
 125            490 P = G/(A*XNT)                                                        H51P117
                    GO TO 510                                                            H51P118
                500 A = G/(P*XNT)                                                        H51P119
                510 G = A*P*XNT                                                          H51P120
                    RETURN                                                               H51P127
 130                END                                                                  H51P128


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    2  PROBRD         1           129

VARIABLES        SN  TYPE              RELOCATION
    0  A             REAL                 ABLK          REFS        7       52       56      124      125      128
                                                     DEFINED       30      127
   51  AG            REAL        ARRAY    ABLK          REFS        7      114  DEFINED      112
   13  AH            REAL        ARRAY    ABLK          REFS        7
   25  AK            REAL        ARRAY    ABLK          REFS        7
    1  AP            REAL        ARRAY    ABLK          REFS        7
   37  ASIG          REAL        ARRAY    ABLK          REFS        7      114  DEFINED      112
    2  B             REAL                 BBLK          REFS        8       95  DEFINED       94
    0  BIGX          REAL                 BBLK          REFS        8       95  DEFINED       94
    1  BIGY          REAL                 BBLK          REFS        8       95  DEFINED       94
    1  DELTA         REAL        ARRAY    DBLK          REFS       10      108  DEFINED      107
    0  DPR           REAL                 DBLK          REFS       10  DEFINED       22
    0  E             REAL                 EBLK          REFS       11
    1  ERX           REAL        ARRAY    EBLK          REFS       11       91  DEFINED       90
   63  ERY           REAL        ARRAY    EBLK          REFS       11       91  DEFINED       90
    0  G             REAL                 GBLK          REFS       12       31       32       56      125      127
                                                     DEFINED       30       31       32      128
    1  GAMMA         REAL        ARRAY    GBLK          REFS       12      103      117  DEFINED      102      117
   13  GPRINT        REAL        ARRAY    GBLK          REFS       12
    0  H             REAL        ARRAY    HBLK          REFS       13       99
 1100  I             INTEGER                            REFS       24       28     2*90     2*91       99      102      103
                                                          107      108    2*112    2*114    2*117  DEFINED       24       28
                                                           90       91       99      102      103      107      108      112
                                                          114      116
    0  ICM           INTEGER     ARRAY    IBLK          REFS       14       28  DEFINED       24
 1105  KERN          INTEGER     ARRAY                  REFS        4       41       44       47       50       59       63
                                                           66       69       72      122  DEFINED       19
    1  LFUNC         INTEGER              TYPBK         REFS        9       32
    0  LMH           INTEGER              TYPBK         REFS        9
    5  NOD           INTEGER              NBLK          REFS       15      106      107      108  DEFINED       78
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        SUBROUTINE PROBRD      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE     4

VARIABLES       SN  TYPE             RELOCATION
     0  NOG          INTEGER             NBLK         REFS        15        102        103        116   DEFINED        77
     1  NOH          INTEGER             NBLK         REFS        15         38         99    DEFINED        80
     6  NOSG         INTEGER             NBLK         REFS        15        111        112        114   DEFINED        79
     2  NPT          INTEGER             NBLK         REFS        15         89         90         91     2*120
                                               DEFINED        88
     3  NX           INTEGER             NBLK         REFS        15    DEFINED         93
     4  NY           INTEGER             NBLK         REFS        15    DEFINED         93
     0  P            REAL                PBLK         REFS        16         52         56        127        128
                                               DEFINED        30        125
    14  PHIE         REAL                PBLK         REFS        16         84         85    DEFINED         83        84
     1  PI           REAL                PBLK         REFS        16         22         23    DEFINED         21
     2  PVMTST       REAL        ARRAY   PBLK         REFS        16
     0  RPD          REAL                RBLK         REFS        17        117    DEFINED         23
     1  RZERO        REAL                RBLK         REFS        17
     0  XK           REAL                XBLK         REFS        18         56    DEFINED         37
     1  XLA          REAL                XBLK         REFS        18         81    DEFINED         61
     2  XLB          REAL                XBLK         REFS        18         81    DEFINED         61
     3  XLC          REAL                XBLK         REFS        18         81    DEFINED         61
     4  XLD          REAL                XBLK         REFS        18         81    DEFINED         61
     5  XMU          REAL                XBLK         REFS        18
     6  XNA          REAL                XBLK         REFS        18         85        119    DEFINED         83
     7  XNB          REAL                XBLK         REFS        18         85        119    DEFINED         83
    10  XNC          REAL                XBLK         REFS        18         85        119    DEFINED         83
    11  XND          REAL                XBLK         REFS        18         85        119    DEFINED         83
  1103  XNOD         REAL                             REFS        62         65         78         81   DEFINED        61
  1101  XNOG         REAL                             REFS        46         49         56         77   DEFINED        30
  1102  XNOH         REAL                             REFS        40         43         56         80   DEFINED        38
  1104  XNOSG        REAL                             REFS        68         71         79         81   DEFINED        61
    12  XNT          REAL                XBLK         REFS        18        121        125        127        128
                                               DEFINED       119        120
    13  XOP3         REAL                XBLK         REFS        18         88         95    DEFINED         83        94
    14  XOP6         REAL                XBLK         REFS        18         95    DEFINED         94
     7  XXK          REAL                NBLK         REFS        15         37

FILE NAMES      MODE
        TAPE6   FMT                     WRITES        26        28         36         53         56         74        81        85
                                            91        95        99        103        108        114
        TAPE7   FMT                      READS        24        30         61         83         90         94       102       107
                                           112    MOTION        20

EXTERNALS           TYPE    ARGS         REFERENCES
        ERN                   3               41        44        47         50         59         63         66        69        72
                                             122

STATEMENT LABELS              DEF LINE    REFERENCES
   461  10       FMT               25          24
   466  20       FMT               27          26
   500  30       FMT               29          28
   526  40       FMT               39          30        61        83         94
   743  42       FMT               98          90       102       107
   702  43       FMT               92          91
   533  45       FMT               54          53
   556  50       FMT               57          56
   601  60       FMT               75          74
   624  65       FMT               82          81
   653  70       FMT               86          85
   237  73                         94          89
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          SUBROUTINE PROBRD       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00       PAGE     5

STATEMENT LABELS                 DEF LINE    REFERENCES
   731  75        FMT                 96         95
   751  80        FMT                100         99
   767  85        FMT                104        103
  1006  90        FMT                109        108
  1023  92        FMT                113        112
  1034  95        FMT                115        114
   304  97                           111        106
   340  99                           116        111
     0  200             INACTIVE      41       2*40
     0  205             INACTIVE      44         43
    50  210                           43         40
    57  211                           46       2*43
     0  215             INACTIVE      50         49
     0  220             INACTIVE      47       2*46
    65  225                           49         46
    74  230                           52       2*49
   106  240                           59         52
   112  245                           61         58
     0  250             INACTIVE      63         62
   122  255                           65       2*62
     0  260             INACTIVE      66         65
   131  265                           68       2*65
     0  270             INACTIVE      69         68
   137  275                           71       2*68
     0  280             INACTIVE      72         71
   146  285                           74       2*71
     0  300                          118        116
     0  400             INACTIVE     122      2*121
   365  410                          124        121
     0  490             INACTIVE     125      2*124
   373  500                          127        124
   377  510                          128        126
   513  1000      FMT                 34         36
    24  8990                          30         42       45        48        51        60        64        67        70        73
                                                123

LOOPS  LABEL      INDEX     FROM-TO    LENGTH     PROPERTIES
  205            * I        90 90       10B                 EXT REFS
  222            * I        91 91       10B                 EXT REFS
  310            * I       112 112      10B                 EXT REFS
  325            * I       114 114      10B                 EXT REFS
  341   300        I       116 118      6B        INSTACK

COMMON BLOCKS     LENGTH     MEMBERS - BIAS NAME(LENGTH)
         ABLK         51              0 A      (1)              1 AP     (10)              11 AH      (10)
                                     21 AK     (10)            31 ASIG   (10)              41 AG      (10)
         RBLK          3              0 BIGX   (1)              1 BIGY   (1)                2 B       (1)
         TYPBK         2              0 LMH    (1)              1 LFUNC  (1)
         DBLK         11              0 DPR    (1)              1 DELTA  (10)
         EBLK        101              0 E      (1)              1 ERX    (50)              51 ERY     (50)
         GBLK       1011              0 G      (1)              1 GAMMA  (10)              11 GPRINT  (1000)
         HBLK         10              0 H      (10)
         IBLK         10              0 ICM    (10)
         NBLK          8              0 NOG    (1)              1 NOH    (1)                2 NPT     (1)
                                      3 NX     (1)              4 NY     (1)                5 NOD     (1)
                                      6 NOSG   (1)              7 XXK    (1)
         PBLK         13              0 P      (1)              1 PI     (1)                2 PVMTST  (10)
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```
      SUBROUTINE PROBRD      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00          PAGE      6

COMMON BLOCKS    LENGTH       MEMBERS - BIAS NAME(LENGTH)
                                    12 PHIE     (1)
      RBLK            2              0 RPD      (1)              1 RZERO   (1)
      XBLK           13              0 XK       (1)              1 XLA     (1)              2 XLB     (1)
                                     3 XLC      (1)              4 XLD     (1)              5 XMU     (1)
                                     6 XNA      (1)              7 XNB     (1)              8 XNC     (1)
                                     9 XND      (1)             10 XNT     (1)             11 XOP3    (1)
                                    12 XOP6     (1)

STATISTICS
  PROGRAM LENGTH                  11128     586
  CM LABELED COMMON LENGTH        23238    1235
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```
SUBROUTINE CURVE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     1

  1                              SUBROUTINE CURVE                                          H51R003
               C
               C                                                                           H51R004
               C                                                                           H51R005
  5                  COMMON /ABLK/ A.AP(10).AH(10).AK(10).ASIG(10).AG(10)                  H51R006
                     COMMON /DBLK/ DPR,DELTA(10)                                           H51R008
                     COMMON /EBLK/ E                                                       H51R009
                     COMMON /GBLK/ G,GAMMA(10).GPRINT(100,10)                              H51R011
                     COMMON /HBLK/ H(10)                                                   H51R012
 10                  COMMON /IBLK/ ICM(10),ILH,ILD,ISG,INOG                                H51R013
                     COMMON /NBLK/ NOG,NOH,NPT,NX,NY,NOD,NOSG                              H51R014
                     COMMON /PBLK/ P,PI,PVMTST(10).PHIE                                    H51R015
                     COMMON /RBLK/ RPD,RZERO                                               H51R016
                     COMMON /XBLK/ XK,XLA,XLB,XLC,XLD,XMU,XNA,XNB,XNC,XND                  H51R021
 15                  GAMMA(INOG) = GAMMA(INOG) * DPR                                       H51R027
                     WRITE (6,10) E, XMU                                                   H51R028
                  10 FORMAT (1H1,4X, 3HE =,F10.1,5X, 5HXMU =,F6.3)                         H51R029
                     WRITE (6,30) XLA,XLB,XLC,XLD                                          H51R030
                  30 FORMAT(1H0,10X, 4HGEAR /                                              H51R031
 20                1        1H ,10X,3HA =,F7.2,8H(IN) B =,F7.2,8H(IN) C =,F7.2,            H51R032
                  2        8H(IN) D =,F7.2 )                                               H51R033
                     WRITE (6,40) XNA,XNB,XNC,XND                                          H51R034
                  40 FORMAT(1H ,10X,4HNA =,F5.1,6X,4HNB =,F5.1,6X,4HNC =,F5.1,6X,4HND =H51R035
                   1 , F5.1 )                                                              H51R036
 25                  WRITE (6,50) A,PHIE                                                   H51R037
                  50 FORMAT(1H0,10X,26HCONTACT AREA OF ONE TIRE =,F9.2,8H(SQ.IN.),         H51R038
                   1 10X, 6HPHIE =,F5.3)                                                   H51R039
                     WRITE (6,60) H(ILH), GAMMA(INOG), DELTA(ILD), PVMTST(INOG)            H51R040
                  60 FORMAT (1H0,4X, 3HH =,F8.3,5X, 7HGAMMA =,F8.3,5X, 7HDELTA =,F8.3, H51R041
 30                1  5X, 3HN= ,F11.3)                                                     H51R042
                     DO 100 ISG=1,NOSG                                                     H51R043
                     WRITE (6,70) ASIG(ISG), AG(ISG), AP(ISG), AH(ISG), AK(ISG)            H51R044
                  70 FORMAT (1H0,2X, 7HSIGMA =,F 8.3,2X, 3HG =,F 8.1,2X, 3HP =F7.1,2X, H51R045
                   1  3HH =F8.3,2X,3HK =,F8.1)                                             H51R046
 35              100 CONTINUE                                                              H51R047
                     GAMMA(INOG) = GAMMA(INOG) * RPD                                       H51R048
                     RETURN                                                                H51R049
                     END                                                                   H51R050


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

   31     I                   CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.


          SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS     DEF LINE     REFERENCES
     2  CURVE         1           37
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       SUBROUTINE CURVE      74/74  OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00      PAGE     2

VARIABLES     SN  TYPE          RELOCATION
    0  A         REAL                   ABLK         REFS         5       25
   51  AG        REAL       ARRAY   ABLK         REFS         5       32
   13  AH        REAL       ARRAY   ABLK         REFS         5       32
   25  AK        REAL       ARRAY   ABLK         REFS         5       32
    1  AP        REAL       ARRAY   ABLK         REFS         5       32
   37  ASIG      REAL       ARRAY   ABLK         REFS         5       32
    1  DELTA     REAL       ARRAY   DBLK         REFS         6       28
    0  DPR       REAL               DBLK         REFS         6       15
    0  E         REAL               EBLK         REFS         7       16
    0  G         REAL               GBLK         REFS         8
    1  GAMMA     REAL       ARRAY   GBLK         REFS         8       15        28        36    DEFINED       15        36
   13  GPRINT    REAL       ARRAY   GBLK         REFS         8
    0  H         REAL       ARRAY   HBLK         REFS         9       28
    0  ICM       INTEGER    ARRAY   IBLK         REFS         10      
   13  ILD       INTEGER            IBLK         REFS         10      28
   12  ILH       INTEGER            IBLK         REFS         10      28
   15  INOG      INTEGER            IBLK         REFS         10      2*15      2*28      2*36
   14  ISG       INTEGER            IBLK         REFS         10      5*32   DEFINED      31
    5  NOD       INTEGER            NBLK         REFS         11
    0  NOG       INTEGER            NBLK         REFS         11
    1  NOH       INTEGER            NBLK         REFS         11
    6  NOSG      INTEGER            NBLK         REFS         11      31
    2  NPT       INTEGER            NBLK         REFS         11
    3  NX        INTEGER            NBLK         REFS         11
    4  NY        INTEGER            NBLK         REFS         11
    0  P         REAL               PBLK         REFS         12
   14  PHIE      REAL               PBLK         REFS         12      25
    1  PI        REAL               PBLK         REFS         12
    2  PVMTST    REAL       ARRAY   PBLK         REFS         12      28
    0  RPD       REAL               RBLK         REFS         13      36
    1  RZERO     REAL               RBLK         REFS         13
    0  XK        REAL               XBLK         REFS         14
    1  XLA       REAL               XBLK         REFS         14      18
    2  XLB       REAL               XBLK         REFS         14      18
    3  XLC       REAL               XBLK         REFS         14      18
    4  XLD       REAL               XBLK         REFS         14      18
    5  XMU       REAL               XBLK         REFS         14      16
    6  XNA       REAL               XBLK         REFS         14      22
    7  XNB       REAL               XBLK         REFS         14      22
   10  XNC       REAL               XBLK         REFS         14      22
   11  XND       REAL               XBLK         REFS         14      22

FILE NAMES       MODE
       TAPE6     FMT                   WRITES      16        18        22        25        28        32

STATEMENT LABELS             DEF LINE   REFERENCES
   60  10      FMT              17        16
   74  30      FMT              19        18
  114  40      FMT              23        22
  130  50      FMT              26        25
  147  60      FMT              29        28
  167  70      FMT              33        32
    0  100                      35        31
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       SUBROUTINE CURVE      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     3

LOOPS  LABEL    INDEX      FROM-TO     LENGTH    PROPERTIES
   32  100    * ISG          31 35        15B               EXT REFS

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       ABLK          51                  0 A       (1)               1 AP      (10)              11 AH      (10)
                                        21 AK      (10)             31 ASIG    (10)              41 AG      (10)
       DBLK          11                  0 DPR     (1)               1 DELTA   (10)
       EBLK           1                  0 E       (1)
       GHLK        1011                  0 G       (1)               1 GAMMA   (10)              11 GPRINT  (1000)
       HBLK          10                  0 H       (10)
       IBLK          14                  0 ICM     (10)             10 ILH     (1)               11 ILD     (1)
                                        12 ISG     (1)              13 INOG    (1)
       NBLK           7                  0 NOG     (1)               1 NOH     (1)                2 NPT     (1)
                                         3 NX      (1)               4 NY      (1)                5 NOD     (1)
                                         6 NOSG    (1)
       PBLK          13                  0 P       (1)               1 PI      (1)                2 PVMTST  (10)
                                        12 PHIE    (1)
       RBLK           2                  0 RPD     (1)               1 RZERO   (1)
       XBLK          10                  0 XK      (1)               1 XLA     (1)                2 XLB     (1)
                                         3 XLC     (1)               4 XLD     (1)                5 XMU     (1)
                                         6 XNA     (1)               7 XNB     (1)                8 XNC     (1)
                                         9 XND     (1)

STATISTICS
  PROGRAM LENGTH                 177B       127
  CM LABELED COMMON LENGTH     2152B      1130
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```
    SUBROUTINE TABINT      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE      1

 1                      SUBROUTINE TABINT (X,Z,Y,NX,NY,TABLE,IND)
                        DIMENSION TABLE(NX,NY),B(3,3)
                 C      LOCATE HASE POINT
                 C      VERIFY XY ON TABLE
 5               C      SET LOCAL COORDINATES
                        T1= X*10.+0.5
                        T2= Y*10.+0.5
                        I= T1
                        J= T2
10                      IF(I .EQ. NX-2) I=NX-3
                        IF(J .EQ. NY-2) J=NY-3
                        IND= 1
                        IF(I .LT. 0) IND= 2
                        IF(X .GT. 3.95) IND=3
15                      IF(J .LT. 0) IND= 4
                        IF(Y .GT. 3.95) IND=5
                        IF(IND .NE. 1) RETURN
                        XL= T1-0.5-I
                        YL= T2-0.5-J
20                      DO 1 M=1,3
                        DO 1 N=1,3
                  1     B(M,N)= TABLE(I+M,J+N)
                 C      MULTIPLE REGRESSION DETERMINATION OF QUADRIC
                        T1= 0.
25                      T2= 0.
                        DO 2 N=1,3
                        T1= T1-B(1,N)+B(3,N)
                  2     T2= T2-B(N,1)+B(N,3)
                        C1= T1/6.
30                      C2= T2/6.
                        T1= 0.
                        T2= 0.
                        DO 3 N=1,3
                        T1= T1+B(1,N)+B(3,N)
35                3     T2= T2+ B(N,1)+B(N,3)
                        C3= (3.*T1-2.*T2-6.*B(2,2))/10.
                        C5= C3+(T2-T1)/2.
                        C4= (B(1,1)-B(3,1)-B(1,3)+B(3,3))/4.
                        Z= YL*(C5*YL+C2)+XL*(C3*XL+C1)+XL*YL*C4+B(2,2)
40                      RETURN
                        END


    SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   4  TABINT          1          17          40

VARIABLES       SN  TYPE             RELOCATION
  262  B            REAL        ARRAY                     REFS        2        2*27      2*28      2*34      2*35      36       4*38
                                                            39    DEFINED       22
  255  C1           REAL                                  REFS       39    DEFINED        29
  256  C2           REAL                                  REFS       39    DEFINED        30
  257  C3           REAL                                  REFS       37        39    DEFINED        36
```

```
      SUBROUTINE TABINT      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE              RELOCATION
  261  C4          REAL                             REFS       39    DEFINED     38
  260  C5          REAL                             REFS       39    DEFINED     37
  247  I           INTEGER                          REFS       10        13      18        22     DEFINED       8        10
    0  IND         INTEGER                 F.P.     REFS       17    DEFINED      1        12         13       14        15
                                                     16
  250  J           INTEGER                          REFS       11        15      19        22     DEFINED       9        11
  253  M           INTEGER                          REFS     2*22    DEFINED     20
  254  N           INTEGER                          REFS     2*22      2*27    2*28      2*34       2*35
                                                 DEFINED       21        26      33
    0  NX          INTEGER                 F.P.     REFS        2      2*10  DEFINED        1
    0  NY          INTEGER                 F.P.     REFS        2      2*11  DEFINED        1
    0  TABLE       REAL          ARRAY     F.P.     REFS        2        22  DEFINED        1
  245  T1          REAL                             REFS        8        18      27        29         34       36        37
                                                 DEFINED        6        24      27        31         34
  246  T2          REAL                             REFS        9        19      28        30         35       36        37
                                                 DEFINED        7        25      28        32         35
    0  X           REAL                    F.P.     REFS        6        14  DEFINED        1
  251  XL          REAL                             REFS     3*39    DEFINED     18
    0  Y           REAL                    F.P.     REFS        7        16  DEFINED        1
  252  YL          REAL                             REFS     3*39    DEFINED     19
    0  Z           REAL                    F.P.  DEFINED        1        39

STATEMENT LABELS               DEF LINE   REFERENCES
    0  1                          22         20         21
    0  2                          28         26
    0  3                          35         33

LOOPS  LABEL      INDEX      FROM-TO    LENGTH     PROPERTIES
  106  1        * M          20 22        16B                NOT INNER
  110  1          N          21 22        11B         OPT
  132  2          N          26 28        13B         OPT
  161  3          N          33 35        13B         OPT

STATISTICS
  PROGRAM LENGTH                311B      201
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```
      OVERLAY(LIFE,3,0)
      PROGRAM PAVE
      REAL HFRL(20),DUM(20)
      DIMENSION    TTRKK(20)
      DIMENSION TRK(20),THF(20)
      DIMENSION HF(20)
      DIMENSION FAIL1(10,10)
      DIMENSION COVM(20),STORE(20),FAIL(10,20,10),FAIL3(10,20)
      DIMENSION TMT(20),IX(20),CCST(2,10)
      DIMENSION SSTRT(10),STMO(10,4),TSTRT(10),TTMO(10,4)
      DIMENSION COV(9),A1(9),A2(9),A4(9),A6(9),A8(9),A12(9),A16(9)
     1, A18(9),A24(9)
      COMMON/ABLK3/AKEFT(10),IFSWIT(10)
      COMMON /AKBLK/ AKEF(10),PAVT,BIG,TBS,AKY
      COMMON /AMBLK/ MXN,IBN
      COMMON /ARBK/ AREA
      COMMON /BLBLK/ IRL
      COMMON/BLOCKB/COMPF,COMPR,FCOMPF,FCOMPR,SLSDBTF,
     1    SLSDBTR,SLSPENF,SLSPENR,FLSF,FLSR,RSUBF,RSUBR,
     2    FRSUBF,FRSUBR,PRDBTF,PRFLTF,PRDBTR,PRFLTR,XTRA
      COMMON/BLOCKD/PVTFLX,PVTRGD,IFLEXNA,IRIGDNA
      COMMON /BMBLK/ TRA(20),TRAA(20)
      COMMON/BSBLK/IBTE,FDE,BTE,GBM
      COMMON /CNT/ ICNT
      COMMON /DMBLK/ TRST
      COMMON /DOBK/ ID,ITY,DT2O,DT
      COMMON /DOM/ MNT
      COMMON /EMBLK/ FAIL2(10,10)
      COMMON /FMBLK/ DHD,IIX(10,10),THK(10,10)
      COMMON /HBLK/ HH(10),TM(20),AHH(10)
      COMMON/IABLK/FACC,FACN,LT,IA
      COMMON /KAYBK/ IAXK
      COMMON /LCY/ AXK,YK,TRY(20),FAC,LS,XCBR,XSTR
      COMMON/LTTBLK/LTT(10),IAA(10)
      COMMON /LYTD/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSBB,XMT(10,6),
     1NB,ZMT(3,4)
      COMMON /MANLK/ JMAN,MLYST,NYOO(20),JXX(20,20)
      COMMON/MIXBLK/STORE1(10,10),STORE2(10,10),COVRGD(10,20),IMIX
      COMMON/MXBLK/IGINT,ICBR
      COMMON /NANLK/ NLYST
      COMMON /NBLK/ NOGQ,NOH,NPTQ,NXQ,NYQ,NODQ,NOSGQ,XK
      COMMON /PASSBK/ NPASS
      COMMON /PQZ/ TRPQZ(20)
      COMMON /RDSTR/ IMAN,NUMS,NOO(10),CSTRT(10,6)
      COMMON /RESTR/ IREST,JREST,ICOUNT
      COMMON /RLSVK/ RSTRT(10),FSTRT(10),RTMO(10,4),FTMO(10,4),NRSTRT,
     1NFSTRT
      COMMON /RODLOD/ IDR,LZ,IDF
      COMMON /SCAN3/ JDL
      COMMON /SG5WP2/ XFP(20,10)
      COMMON /SUBK/ SUBD,IUBC,IDRY
      COMMON /S7BK/ MXTO,MNTO
      COMMON /THKBK/ THFF(20),TRKK(20)
      COMMON /TYP/ NRIGID,NFLEX
      COMMON /TYPBK/ LMH,LFUNC
      COMMON /T1BK/ T1
      COMMON/WES/ESWL(10,20),AESWL(10),WHEELS(10),CBR(20)
      COMMON /XMBLK/ LIMT
      DATA HF/1.,2.,3.,4.,5.,10.,15.,20.,25.,30.,40.,50.,60.,70.,80.,90.
     1,100.,120.,140.,150./
      DATA HFRL/1.,2.,3.,4.,5.,6.,7.,8.,9.,10.,12.,14.,16.,18.,20.,22.,
     T24.,28.,32.,36./
      DATA COV /0.,1.,1.3979400087,1.7781512504,2.,2.3010299957,3.,4.,5
     1./
      DATA A1 /.20,.41,.49,.56,.61,.67,.81,.99,1.16/
      DATA A2/.19,.39,.48,.55,.59,.64,.75,.89,1.03/
      DATA A4/.18,.39,.47,.54,.576,.62,.71,.82,.92/
      DATA A6 /.16,.38,.46,.53,.56,.60,.68,.78,.86/
      DATA A8 /.16,.38,.46,.52,.55,.59,.67,.76,.83 /
      DATA A12 /.15,.37,.45,.51,.54,.58,.65,.73,.78/
      DATA A16 / .15,.36,.44,.51,.54,.58,.65,.71,.75 /
      DATA A18 /.14,.36,.44,.50,.54,.57,.64,.70,.74/
      DATA A24 /.13,.35,.43,.50,.53,.57,.63,.68,.71/
      RCOVLO(X)=10.**((X-.7707970326)/.1430676558)
      RCOVHI(X)=10.**((X-.071228762)/.3321928095)
 1008 FORMAT(" PAVE-IRIGDNA " I4)
 1009 FORMAT(" PAVE-FDE " F10.2)
 1010 FORMAT(" PAVE-COMPF,FCOMPF,PVTFLX,SLSDBTF,FLSF "5F10.2)
 1097 FORMAT(" PARTIAL PROTECTION IS THE DESIGN CRITERIA THIS ANSWER WAS
     1 BASED ON")
 1098 FORMAT(" FULL PROTECTION IS THE DESIGN CRITERIA THIS ANSWER WAS BA
     1SED ON")
 1099 FORMAT(" REDUCED SUBGRADE STRENGTH IS THE DESIGN CRITERIA THIS ANS
     1WER WAS BASED ON")
 1101 FORMAT(" PAVE-IRIGDNA ",I2)
 1102 FORMAT(" PAVE-FDE ",F10.2)
 1103 FORMAT(" PAVE- BASE(T1),PAVEMENT(TT) ",2F10.2)
 1104 FORMAT(" PAVE-ACOST,BCOST,BIG ",3F10.2)
 1717 FORMAT(/" PAVE-TM,TRKK,DT ",3F10.5)
 1718 FORMAT(/" PAVE-XXT ",F10.5)
 1821 FORMAT(" PAVE- PARTIAL P USED ")
 1822 FORMAT(" PAVE-REDUCED STRTH USED")
 1823 FORMAT(" PAVE- ZA=RE STH ")
 1824 FORMAT(" PAVE- ANSWER=P P")
 1825 FORMAT(" PAVE-BIG "F10.0,20X,"TBIG "F10.0)
 2000 FORMAT(2X,12F6.0)
 2100 FORMAT(33H EXISTING PAVEMENT WILL LAST FOR ,F6.0,29H YRS WITHOUT
     1AN OVERLAY-PAVE)
 2500 FORMAT(/" PAVE-INACCURATE ESTIMATE OF BASE THICKNESS"2(F10.2)/)
 2727 FORMAT(/" PAVE-TM,THFF,DT ",3F10.5)
 3000 FORMAT(10F10.4)
 5000 FORMAT(20I2)
 6000 FORMAT(/" PAVE-THICKNESS VS TIME ARRAYS")
 7000 FORMAT(1H0,10E11.4)
 7250 FORMAT(2X," PAVE-RIGID COST=",F12.2,10X,"  FLEXIBLE, COST=$  ",
     1F12.2)
 7500 FORMAT(/2X," PAVE-CHEAPEST STRATEGIES FOR ",2X/)
 8000 FORMAT(1H0,3X," PAVE-STRESS IS TOO LOW")
 8250 FORMAT(2X," PAVE-THICKNESS ",10F6.0)
 8500 FORMAT(2X," PAVE-RIGID DESIGN "/)
 9000 FORMAT(2X," PAVE-TYPE ",10I2)
 9122 FORMAT(" PAVE-ERROR ON NUMBER OF WHEELS CARD"/)
 9500 FORMAT(/2X," PAVE-FLEXIBLE DESIGN"/)
 9600 FORMAT(" PAVE-STRESS TOO HIGH")
 9700 FORMAT(1H0,4I15)
      IBAD=0
      ICNT=0
      KBAD=0
      IF(LZ.EQ.3) GO TO 26
      IF(NRIGID.EQ.0) GO TO 125
      DO 1 I=1,NOH
      DO 1 J=1,IMIX
      FAIL1(J,I)=0.
      IF(IAXK.NE.1) GO TO 430
      FAIL2(J,I)=0.
  430 CONTINUE
      LT=LTT(J)
      X1=XSTR/(STORE1(J,I))
      IF(IAXK.NE.1) GO TO 431
      X2=XSTR/(STORE2(J,I))
      WRITE(6,7000)X1,X2
  431 IF(IAXK.NE.1) WRITE(6,7000; X1
      IF(X1-.771) 13,14,14
   13 IF(KBAD.NE.I) IBAD=IBAD+1
      KBAD=I
      WRITE(6,9600)
      GO TO 1
   14 CONTINUE
      IF(X1.LE.1.3)XXK=RCOVLO(X1)
      IF(X1.GT.1.3)XXK=RCOVHI(X1)
      FAIL1(J,I)=XXK
      IF(IAXK.NE.1) GO TO 1
      IF(X2-.771) 15,16,16
   15 IF(KBAD.NE.I) IBAD=IBAD+1
      KBAD=I
      WRITE(6,9600)
      GO TO 1
   16 CONTINUE
      IF(X2.LE.1.3) XXA=RCOVLO(X2)
      IF(X2.GT.1.3) XXA=RCOVHI(X2)
      FAIL2(J,I)=XXA
    1 CONTINUE
      WRITE(6,7000) ((FAIL1(J,I),J=1,IMIX),I=1,NOH)
      IF(IAXK.NE.1) GO TO 432
      WRITE(6,7000) ((FAIL2(J,I),J=1,IMIX),I=1,NOH)
  432 CONTINUE
      NOH=NOH-IBAD+1
      IF(IBAD.EQ.0) NOH=NOH-1
      NOI=2
      IF(IBAD.EQ.0) NOI=1
      DO 100 II=NOI,NOH
      IIBAD=II+IBAD-1
      IF(IBAD.EQ.0) IIBAD=II
      HH(II)=HH(IIBAD)
      IF(IAXK.NE.1) GO TO 433
      AHH(II)=AHH(IIBAD)
  433 CONTINUE
      X=HH(II)
      HH(II)=X**2
      DO 100 J=1,IMIX
      FAIL1(J,II)=FAIL1(J,IIBAD)
      IF(IAXK.NE.1) GO TO 100
      FAIL2(J.II)=FAIL2(J.IIBAD)
  100 CONTINUE
      IF(IBAD.EQ.0) GO TO 650
      GIB=0.
      DO 800 J=1.IMIX
      IF(GIB.GT.STORE1(J.IBAD+1)) GO TO 800
      GIB=STORE1(J.IBAD+1)
      MNT=J
 800  CONTINUE
      FAIL1(MNT.1)=1.
      IF(IAXK.EQ.1) FAIL2(MNT.1)=1.
      Y2=HH(2)
      Y3=HH(3)
      Z1=ALOG10(FAIL1(MNT.1))
      Z2=ALOG10(FAIL1(MNT.2))
      Z3=ALOG10(FAIL1(MNT.3))
      HH(1)=Y2-(Z2-Z1)*(Y3-Y2)/(Z3-Z2)
      IF(HH(1).LT.0.) HH(1)=0.
      DO 660 J=1.IMIX
      Z2=ALOG10(FAIL1(J.2))
      Z3=ALOG10(FAIL1(J.3))
      Y1=Z2-(Z3-Z2)*(Y2-HH(1))/(Y3-Y2)
      FAIL1(J.1)=10.**Y1
 660  CONTINUE
      IF(IAXK.NE.1) GO TO 810
      DO 820 J=1.IMIX
      Z2=ALOG10(FAIL2(J.2))
      Z3=ALOG10(FAIL2(J.3))
      Y1=Z2-(Z3-Z2)*(Y2-HH(1))/(Y3-Y2)
      FAIL2(J.1)=10.**Y1
 820  CONTINUE
 810  CONTINUE
      AHH(1)=SQRT(HH(1))
 650  CONTINUE
      WRITE(6.7000) ((FAIL1(J.I).J=1.IMIX).I=1.NOH)
      WRITE(6.7000) ((FAIL2(J.I).J=1.IMIX).I=1.NOH)
      WRITE(6.7000) (HH(I).I=1.NOH)
      WRITE(6.7000) (AHH(I).I=1.NOH)
      KK=NOH
      CALL MIXED(COVRGD.FAIL1.NOH.HH.TRKK.TRK  .IMIX.LS)
      DO 25 I=1.LS
      X=TRKK(I)
      TRKK(I)=SQRT(X)
 25   CONTINUE
26    CONTINUE
      MNT=IMIX
      IF(LZ.NE.3) GO TO 38
      DO 61 I=1.LS
61    DUM(I) = COVRGD(1.I)
      CALL RODTHK(DUM   .LS.TRKK)
      X = HH(1)
      DO 40 I = 1.LS
40    TRKK(I) = TRKK(I)*X
38    CONTINUE
      WRITE(6.6000)
      WRITE(6.3000) (TRKK(I).I=1.LS)
      DO 253 I=1,LS
      TRPQZ(I)=TRKK(I)
  253 CONTINUE
  125 CONTINUE
      IF(INFLEX.LE.0) GO TO 7
      DO 6 JJ=1,IMIX
      DO 27 II=1,LS
      LL=JJ
      IF(LZ.EQ.3) LL=2
      IA=IAA(JJ)
      IF(IA.EQ.2)
     1COVRGD(JJ,II)=COVRGD(JJ,II)*2.
      COVM(II)=COVRGD(JJ,II)
   27 CONTINUE
      WRITE(6,9700)ICBR
      WRITE(6,7000)CBR
      WRITE(6,7000)HF
      WRITE(6,7000)(ESWL(JJ,I),I=1,20)
      DO 6 J=1,ICBR
      DO 6 K=1,20
      IF(LZ.EQ.3) HF(K)=HFRL(K)
      W=HF(K)
      Y=CBR(J)/ESWL(JJ,K)
      CALL PECHART(Y,TA)
      X=AESWL(JJ)
      AF=TA*SQRT(X)
      AF=W/AF
      IF(LZ.EQ.3)GO TO 22
      WHHELS=WHEELS(JJ)
      KK=9
      IF(WHHELS.EQ.1..AND.AF.GT.1.16) A=(AF-.31)*(5.882352941)
      IF(WHHELS.EQ.1..AND.AF.GT.1.16) GO TO 21
      IF(WHHELS.EQ.1.) CALL GINT(COV,A1,AF,A,KK,9)
      IF(WHHELS.EQ.1.) GO TO 21
      IF(WHHELS.EQ.2..AND.AF.GT.1.03) A=(AF-.35)*(7.352941176)
      IF(WHHELS.EQ.2..AND.AF.GT.1.03) GO TO 21
      IF(WHHELS.EQ.2.) CALL GINT(COV,A2,AF,A,KK,9)
      IF(WHHELS.EQ.2.) GO TO 21
      IF(WHHELS.EQ.4..AND.AF.GT..92) A=(AF-.43)*(10.20408)
      IF(WHHELS.EQ.4..AND.AF.GT..92) GO TO 21
      IF(WHHELS.EQ.4.) CALL GINT(COV,A4,AF,A,KK,9)
      IF(WHHELS.EQ.4.) GO TO 21
      IF(WHHELS.EQ.6..AND.AF.GT..87) A=(AF-.44)*(11.627910698)
      IF(WHHELS.EQ.6..AND.AF.GT..87) GO TO 21
      IF(WHHELS.EQ.6.) CALL GINT(COV,A6,AF,A,KK,9)
      IF(WHHELS.EQ.6.) GO TO 21
      IF(WHHELS.EQ.8..AND.AF.GT..83) A=(AF-.46)*(13.51351)
      IF(WHHELS.EQ.8..AND.AF.GT..83) GO TO 21
      IF(WHHELS.EQ.8.) CALL GINT(COV,A8,AF,A,KK,9)
      IF(WHHELS.EQ.8.) GO TO 21
      IF(WHHELS.EQ.12..AND.AF.GT..78) A=(AF-.52)*(19.23076923)
      IF(WHHELS.EQ.12..AND.AF.GT..78) GO TO 21
      IF(WHHELS.EQ.12.) CALL GINT(COV,A12,AF,A,KK,9)
      IF(WHHELS.EQ.12.) GO TO 21
      IF(WHHELS.EQ.16..AND.AF.GT..75) A=(AF-.55)*(25.)
      IF(WHHELS.EQ.16..AND.AF.GT..75) GO TO 21
      IF(WHHELS.EQ.16.) CALL GINT(COV,A16,AF,A,KK,9)
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```
              IF(WHHELS.EQ.16.) GO TO 21
              IF(WHHELS.EQ.18..AND.AF.GT..74) A=(AF-.57)*(29.41176471)
              IF(WHHELS.EQ.18..AND.AF.GT..74) GO TO 21
              IF(WHHELS.EQ.18.) CALL GINT(COV,A18,AF,A,KK,9)
              IF(WHHELS.EQ.18.)  GO TO 21
              IF(WHHELS.EQ.24..AND.AF.GT..71) A=(AF-.58)*(38.46153846)
              IF(WHHELS.EQ.24..AND.AF.GT..71) GO TO 21
              IF(WHHELS.EQ.24.) CALL GINT(COV,A24,AF,A,KK,9)
              IF(WHHELS.EQ.24.)  GO TO 21
              WRITE(6,9122)
              STOP 3011
         22   A=(4.349*AF)-.652
         21   IF(A.GT.10.) A=10.
              A=10.**A
              FAIL(JJ,K,J)=A
            6 CONTINUE
              IF(LZ.NE.3) GO TO 35
              DO 350 I = 1,LS
              DUM(1) = COVRGD(1,I)
              COVRGD(1,I) = COVRGD(2,I)
        350    COVRGD(2,I) = DUM(1)
        35    CONTINUE
              DO 70 J=1,ICBR
              DO 200 JJ=1,IMIX
              DO 200 K=1,20
              FAIL3(JJ,K)=FAIL(JJ,K,J)
         200  CONTINUE
              WRITE(6,3000) COVRGD(1,10)
              CALL MIXED(COVRGD,FAIL3,20,HF,THFF,THF,IMIX,LS)
              IF(THFF(1).LT.149.) GO TO 419
              DO 420 I=1,LS
        420   THFF(I) = 1.
        419     CONTINUE
              WRITE(6,3000)(THFF(I),I=1,LS)
              X=CHR(J)
              DO 60 I=1,LS
              XFP(I,J)=THFF(I)
              IF(ABS(X-XCBR).LT.0.00001) STORE(I)=THFF(I)
           60 CONTINUE
           70 CONTINUE
              IF(LZ.NE.3) GO TO 36
              DO 351 I = 1,LS
              DUM(1) = COVRGD(1,I)
              COVRGD(1,I) = COVRGD(2,I)
        351    COVRGD(2,I) = DUM(1)
        36    CONTINUE
              DO 770 I=1,LS
              THFF(I)=STORE(I)
         770  CONTINUE
              WRITE(6,3000)(THFF(I),I=1,LS)
         7    CONTINUE
              CF=10000000000.
              CR=10000000000.
              IF(ID.GT.1) GO TO 28
              IF(ID.EQ.1) IREST=ITY+1
              LIMT=1
              IF(ITY.EQ.2) GO TO 32
```

```
      KK=LS
      WRITE(6,1717) TM,TRKK,DT
      CALL GINT(TM,TRKK,DT,XXT,KK,20)
      WRITE(6,1718) XXT
      XXT=AINT(XXT+.74)
      IF(XXT.LE.1.) XXT=1.
      GO TO 404
32    KK=LS
      WRITE(6,2727)TM,THFF,DT
      CALL GINT(TM,THFF,DT,XXT,KK,20)
      WRITE(6,1718) XXT
      XXT=AINT(XXT+.74)
      IF(XXT.LE.1.) XXT=1.
      GO TO 404
28    CONTINUE
      IF(ID.EQ.3) NUMS=1
      LIMT=2
      IF(IREST.GT.1) LIMT=1
      IF(IREST.GT.1) ITY=IREST-1
      DO 33 I=1,10
      DO 33 J=1,NUMS
      THK(I,J)=0.
      IIX(I,J)=0
33    CONTINUE
404   XXO=100.
      XAB=FLOAT(JDL-1)
      IF((ID.NE.1).O.(XXT.LT.XAB)) GO TO 20
      XXT=0.
      WRITE(6,2100) XXT
      NUMS=1
      NOO(1)=0
      CSTRT(1,1)=0.
20    CONTINUE
      MTN=MNTO
      MTX=MXTO
      IF(IMAN.EQ.2) MTN=1
      IF(IMAN.EQ.2) MTX=NUMS
      IF(ID.EQ.3) MTN=1
      IF(ID.EQ.3) MTX=1
      REWIND 7
      DO 30 I=MTN,MTX
      ICOUNT=I
      IF(ID.EQ.1) CSTRT(I,1)=XXT
      IF(ID.EQ.1) GO TO 90
      XXT=FLOAT(I)
      IF(IMAN.EQ.1) GO TO 53
      XXT=CSTRT(I,1)
      NOOQ=NOO(I)
      IF(NOOQ.EQ.0) XXT=FLOAT(JDL)
53    CONTINUE
      CHKK=ABS(XXT-XXO)
      ICK=1
      IF(CHKK.LT.0.1) ICK=2
      IF(CHKK.LT.0.1) GO TO 90
      IF(ID.EQ.3) XXT=FLOAT(JDL)
      ICNT=ICNT+1
      IF(IREST.EQ.3) GO TO 407
      KK=LS
      CALL GINT(TRPOZ.TM.XXT.TT.KK.20)
      T1=4.
      IF (IBTE.NE.5) GO TO 2
      WRITE(6.1008) IRIGDNA
      IF(IRIGDNA.NE.2.AND.IRIGDNA.NE.6)  GO TO 71
      FDE=SLSDBTR + PVTRGD + FLSR
      IFSWIT(2)=1
      WRITE(6.1821)
      GO TO 72
 71   IF(IRIGDNA.NE.1) GO TO 2
      FDE= COMPR + FCOMPR + PVTRGD
      IFSWIT(2)=2
      GO TO 72
   73 FDE =2
   72 CONTINUE
      WRITE(6.1009) FDE
      IF(IRIGDNA.EQ.6) GO TO 74
       IF(FDE.EQ.2) GO TO 2
      IFSWIT(1)=3
      CALL BTCT(TT)
      GO TO 18
  74  IFSWIT(1)=0
      WRITE(6.1822)
       CALL BTCT(TT)
       IF(FDE.EQ.2) GO TO 18
      TBIG=BIG
      TPAVT=PAVT
      TTBS=TBS
      TAKY=AKY
      DO17 J=1.LS
   17 TTRKK(J) = TRKK(J)
      IFSWIT(1)=2
      CALL BTCT(TT)
      WRITE(6.1825) BIG.TBIG
      IF (BIG.LE.TBIG) GO TO 18
      WRITE(6.1823)
      IFSWIT(2)=3
      BIG=TBIG
      PAVT=TPAVT
      TBS=TTBS
      AKY=TAKY
      DO 19 J=1.LS
   19 TRKK(J)=TTRKK(J)
      GO TO 18
    2 CONTINUE
      IF((IBTE.NE.3).AND.(IBTE.NE.4)) GO TO 441
      IFSWIT(1)=3
      CALL BTCT(TT)
 18    CONTINUE
      WRITE(6.1824)
      TT=PAVT
      T1=TBS
  441 CONTINUE
      IF(IBTE.NE.6) GO TO 124
      WRITE(6.1010)COMPF.FCOMPF.PVTFLX.SLSOBTF.FLSF
      WRITE(6.1101) IRIGDNA
      IF(IRIGDNA.NE.2.AND.IRIGDNA.NE.6) GO TO 87
      IFSWIT(2) = 1
    3 FDE=1.
      TT=AINT(TT+.74)
      TTT=TT+T1
      IF(IRIGDNA.EQ.1) GO TO 4
      FDE=SLSDBTR + PVTRGD + FLSR
      GO TO 5
    4 FDE = COMPR + FCOMPR + PVTRGD
    5 CONTINUE
      WRITE(6,1102) FDE
      WRITE(6,1103) T1,TT
      IF(FDE.GT.TTT) T1=FDE-TT
      KK=1
      CALL SERCST(KK,TT,ACOST)
      KK=2
      CALL SERCST(KK,T1,BCOST)
      SVCOST=(ACOST+BCOST)*AREA
      GO TO 89
   87 IF(IRIGDNA.NE.1) GO TO 89
      IFSWIT(2) = 2
      GO TO 3
   89 IF(IRIGDNA.NE.6) GO TO 407
      IFSWIT(1)=0
      CALL BTCT(TT)
      WRITE(6,1104)ACOST,BCOST,BIG
      IF((ACOST+BCOST).LT.BIG) GO TO 407
      IFSWIT(2) = 3
      SVCOST = BIG * AREA
      T1=TBS
      TT=AINT(PAVT+.74)
      GO TO 407
  124 CONTINUE
      IF(IFSWIT(2).EQ.1)  WRITE(8,1097)
      IF(IFSWIT(2).EQ.2) WRITE(8,1098)
      IF(IFSWIT(2).EQ.3) WRITE(8,1099)
      TT=AINT(TT+.74)
      IF(IBTE.EQ.1) TTT=TT+T1
      IF((IBTE.EQ.1).A.(FDE.GT.TTT)) T1=FDE-TT
      KK=1
      CALL SERCST(KK,TT,ACOST)
      KK=2
      CALL SERCST(KK,T1,BCOST)
      SVCOST=(ACOST+BCOST)*AREA
 407  CONTINUE
      REWIND 5
      IF(IREST.EQ.3) GO TO 408
      WRITE(5) TT,T1,SVCOST
      WRITE(6,2000) TT,T1,SVCOST
      NX=I-MNTO+1
      IF(IMAN.EQ.2) NX=ICNT
      IF(ID.EQ.3) NX=1
      IF(IREST.EQ.2) THK(1,NX)=TT
 408  IF(IREST.EQ.2) GO TO 86
      IF(ICNT.GT.1) NPASS=2
      CALL LYR(XXT,TMT,CDF,IX,NLYR)
      IF(IREST.EQ.3) CCST(1,NX)=0.
      IF(IREST.NE.3) CCST(1,NX)=SVCOST
      CCST(2,NX)=CDF
      IF(IREST.EQ.3) THK(1,NX)=0.
      IF(IREST.NE.3) THK(1,NX)=TT
      NXX=NLYR+4
      IF(NCOM.EQ.0) NXX=NXX-1
      IIX(1,NX)=NXX
      DO 31 J=2,NXX
      THK(J,NX)=TMT(J-1)
      IIX(J,NX)=IX(J-1)
31    CONTINUE
86    IF(ID.EQ.3) GO TO 400
90    CALL XMSTR(XXT,CST,CSF)
      IF(IREST.EQ.3) GO TO 412
      WRITE(7) NRSTRT,(RSTRT(MQ),(RTMO(MQ,MF),MF=1,4),MQ=1,NRSTRT)
412   CONTINUE
      IF(ID.EQ.1) GO TO 402
400   CONTINUE
      IF(IREST.EQ.3) GO TO 409
      REWIND 5
      IF(ICK.EQ.2) GO TO 610
      READ(5) TT,T1,SVCOST
610   WRITE(7) ICK
      IF(ICK.EQ.1) WRITE(7) TT,T1,SVCOST
409   CONTINUE
402   CONTINUE
      IF(ID.EQ.3) GO TO 85
      IF(IREST.EQ.2) GO TO 413
      WRITE(7) NFSTRT,(FSTRT(MQ),(FTMO(MQ,MF),MF=1,4),MQ=1,NFSTRT)
413   CONTINUE
      IF(ID.EQ.1) GO TO 403
85    IF(IREST.EQ.2) GO TO 410
401   KCOST=NLYST*MLYST*NB
      IF(NLYST.EQ.0) KCOST=MLYST*NB
      IF(MLYST.EQ.0) KCOST=NLYST*NB
      IF((NLYST.EQ.0).A.(MLYST.EQ.0)) KCOST=NB
      DO 302 KKKL=1,KCOST
      IF(ICK.EQ.2) GO TO 620
      READ(5) NLYR,NQLYR,NKOM
      LLYR=NLYR+3
      IF(NCOM.EQ.0) LLYR=NLYR+2
      READ(5) (IX(IIL),IIL=1,NLYR),ICMP,IBASE
      READ(5) CDF,(TMT(IIL),IIL=1,LLYR)
620   WRITE(7) ICK
      IF(ICK.EQ.1) WRITE(7) NLYR,NQLYR,NKOM
      IF(ICK.EQ.2) GO TO 302
      WRITE(7) (IX(IIL),IIL=1,NLYR),ICMP,IBASE
      WRITE(7) CDF,(TMT(IIL),IIL=1,LLYR)
302   CONTINUE
      REWIND 5
410   CONTINUE
403   CONTINUE
      IF(ID.EQ.3) GO TO 30
      IF(IREST.EQ.3) GO TO 414
      WRITE(6,5000) NRSTRT
      WRITE(6,2000) (RSTRT(MQ),MQ=1,NRSTRT)
      WRITE(6,2000) ((RTMO(MQ,MF),MF=1,4),MQ=1,NRSTRT)
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```
 414  IF(IREST.EQ.2) GO TO 415
      WRITE(6,5000) NFSTRT
      WRITE(6,2000) (FSTRT(MQ),MQ=1,NFSTRT)
      WRITE(6,2000) ((FTMO(MQ,MF),MF=1,4),MQ=1,NFSTRT)
 415  CONTINUE
      IF(IREST.EQ.3) GO TO 416
      IF(CST-CR) 91,92,92
 91   CR=CST
      NSSTRT=NRSTRT
      DO 93 JJ=1,NRSTRT
      DO 93 KK=1,4
      STMO(JJ,KK)=RTMO(JJ,KK)
 93   CONTINUE
 416  CONTINUE
 92   IF(IREST.EQ.2) GO TO 417
      IF(CSF-CF) 94,30,30
 94   CF=CSF
      NTSTRT=NFSTRT
      DO 95 JJ=1,NFSTRT
      TSTRT(JJ)=FSTRT(JJ)
      DO 95 KK=1,4
      TTMO(JJ,KK)=FTMO(JJ,KK)
 95   CONTINUE
 417  CONTINUE
 30   XXO=XXT
      IF(ID.EQ.1) GO TO 405
      IF(IREST.EQ.2) GO TO 411
      DO 300 M=1,ICNT
      WRITE(6,7250) (CCST(I,M),I=1,2)
      NXX=IIX(1,M)
      WRITE(6,8250) (THK(I,M),I=1,NXX)
      WRITE(6,9000) (IIX(I,M),I=1,NXX)
 300  CONTINUE
 411  CONTINUE
 405  IF(ID.EQ.3) GO TO 406
      WRITE(6,7500)
      IF(IREST.EQ.3) GO TO 418
      WRITE(6,8500)
      WRITE(6,2000) (SSTRT(I),I=1,NSSTRT)
      WRITE(6,2000) ((STMO(I,J),J=1,4),I=1,NSSTRT)
 418  IF(IREST.EQ.2) GO TO 406
      WRITE(6,9500)
      WRITE(6,2000) (TSTRT(I),I=1,NTSTRT)
      WRITE(6,2000) ((TTMO(I,J),J=1,4);I=1,NTSTRT)
 406  CONTINUE
      END
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        SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   3  PAVE            2
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          PROGRAM PAVE       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE    12

VARIABLES          SN  TYPE             RELOCATION
 4645  A               REAL                             REFS       261      265      269      273      277      281      285
                                                         289       293      298      299      300  DEFINED      259      263
                                                         267       271      275      279      283      287      291      297
                                                         298       299
 4666  ACOST           REAL                             REFS       471      474      482      483      497      500
  310  AESWL           REAL        ARRAY    WES         REFS        57      253
 4643  AF              REAL                             REFS       255    2*259      260      261    2*263      264      265
                                                       2*267       268      269    2*271      272      273    2*275      276
                                                         277     2*279      280      281    2*283      284      285    2*287
                                                         288       289    2*291      292      293      297
                                                     DEFINED       254      255
   36  AHH             REAL        ARRAY    HBLK        REFS        30      166      210  DEFINED      166      205
    0  AKEF            REAL        ARRAY    AKBLK       REFS        14
    0  AKEFT           REAL        ARRAY    ABLK3       REFS        13
   15  AKY             REAL                 AKBLK       REFS        14      429  DEFINED      441
    0  AREA            REAL                 ARBK        REFS        16      474      485      500
    0  AXK             REAL                 LCY         REFS        33
12021  A1              REAL        ARRAY                REFS        11      261  DEFINED       65
12076  A12             REAL        ARRAY                REFS        11      281  DEFINED       70
12107  A16             REAL        ARRAY                REFS        11      285  DEFINED       71
12120  A18             REAL        ARRAY                REFS        11      289  DEFINED       72
12032  A2              REAL        ARRAY                REFS        11      265  DEFINED       66
12131  A24             REAL        ARRAY                REFS        11      293  DEFINED       73
12043  A4              REAL        ARRAY                REFS        11      269  DEFINED       67
12054  A6              REAL        ARRAY                REFS        11      273  DEFINED       68
12065  A8              REAL        ARRAY                REFS        11      277  DEFINED       69
 4667  RCOST           REAL                             REFS       473      474      482      483      499      500
   13  BIG             REAL                 AKBLK       REFS        14      426      434      435      482      483      485
                                                     DEFINED       438
    2  RTE             REAL                 BSBLK       REFS        23
  334  CBR             REAL        ARRAY    WES         REFS        57      244      251      320
11620  CCST            REAL        ARRAY                REFS         9      599  DEFINED      513      514      515
 4672  CDF             REAL                             REFS       512      515      561  DEFINED      556
 4646  CF              REAL                             REFS       586  DEFINED      337      587
 4656  CHKK            REAL                             REFS       395      396  DEFINED      393
    0  COMPF           REAL                 BLOCKB      REFS        18      455
    1  COMPR           REAL                 BLOCKB      REFS        18      411      465
12010  COV             REAL        ARRAY                REFS        11      261      265      269      273      277      281
                                                         285       289      293  DEFINED       63
 5250  COVM            REAL        ARRAY                REFS         8  DEFINED      241
  310  COVRGD          REAL        ARRAY    MIXBLK      REFS        38      212      221      239      241      304      305
                                                         313       314      328      329  DEFINED      239      305      306
                                                         329       330
 4647  CR              REAL                             REFS       577  DEFINED      338      578
 4676  CSF             REAL                             REFS       526      586      587
 4675  CST             REAL                             REFS       526      577      578
   14  CSTRT           REAL        ARRAY    RDSTR       REFS        44      389  DEFINED      374      385
    0  DHD             REAL                 FMBLK       REFS        29
    3  DT              REAL                 DOBK        REFS        26      344      345      351      352
    2  DT2Q            REAL                 DOBK        REFS        26
 4740  DUM             REAL        ARRAY                REFS         3      222      306      330  DEFINED      221      304
                                                         328
    0  ESWL            REAL        ARRAY    WES         REFS        57      246      251
   26  FAC             REAL                 LCY         REFS        33
    0  FACC            REAL                 IABLK       REFS        31
    1  FACN            REAL                 IABLK       REFS        31
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             PROGRAM PAVE        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE     13

VARIABLES       SN  TYPE                RELOCATION
   5320  FAIL       REAL       ARRAY                  REFS        8      311  DEFINED      300
   5104  FAIL1      REAL       ARRAY                  REFS        7      153      171      186      187      188      192
                                                       193      207      212  DEFINED      123      141      171      182
                                                       195
      0  FAIL2      REAL       ARRAY     EMBLK        REFS       28      155      173      199      200      208
                                                   DEFINED      125      151      173      183      202
  11240  FAIL3      REAL       ARRAY                  REFS        8      314  DEFINED      311
      2  FCOMPF     REAL                 BLOCKB       REFS       18      455
      3  FCOMPR     REAL                 BLOCKB       REFS       18      411      465
      1  FDE        REAL                 BSBLK        REFS       23      416      418      425      467    2*469    2*495
                                                   DEFINED      406      411      414      459      463      465
     10  FLSF       REAL                 BLOCKB       REFS       18      455
     11  FLSR       REAL                 BLOCKB       REFS       18      406      463
     14  FRSUBF     REAL                 BLOCKB       REFS       18
     15  FRSUBR     REAL                 BLOCKB       REFS       18
     12  FSTRT      REAL       ARRAY     RLSVK        REFS       46      542      573      590
     74  FTMO       REAL       ARRAY     RLSVK        REFS       46      542      574      592
      3  GBM        REAL                 BSBLK        REFS       23
   4625  GIB        REAL                              REFS      178  DEFINED      176      179
   5060  HF         REAL       ARRAY                  REFS        6      245      250      314  DEFINED       59      249
   4714  HFRL       REAL       ARRAY                  REFS        3      249  DEFINED       61
      0  HH         REAL       ARRAY     HBLK         REFS       30      164      168      184      185      190      194
                                                       201      205      209      212      223  DEFINED      164      169
                                                       189      190
   4613  I          INTEGER                           REFS      123      125      128      130      134      135      141
                                                       144      145      151      153      155      207      208      209
                                                       210      214      215    2*221    2*225      228    2*230      246
                                                       304    2*305      306      317      319    2*322    2*323      328
                                                     2*329      330    2*333      335      364      365      384      385
                                                       387      389      390      506      599      601      602      609
                                                       610      613      614  DEFINED      121      153      155      207
                                                       208      209      210      213      220      224      228      229
                                                       246      303      316      319      321      327      332      335
                                                       362      383      599      601      602      609      610      613
                                                       614
      3  IA         INTEGER              IABLK        REFS       31      239  DEFINED      238
     12  IAA        INTEGER    ARRAY     LTTBLK       REFS       34      238
      0  IAXK       INTEGER              KAYBK        REFS       32      124      129      132      142      154      165
                                                       172      183      197
   4611  IBAD       INTEGER                           REFS      134      144      157      158      160      162      163
                                                       175      178      179  DEFINED      116      134      144
   4710  IBASE      INTEGER                           REFS      560  DEFINED      555
      1  IBN        INTEGER              AMBLK        REFS       15
      0  IBTE       INTEGER              BSBLK        REFS       23      403    2*446      454      494      495
      1  ICBR       INTEGER              MXBLK        REFS       39      243      247      308
   4657  ICK        INTEGER                           REFS      534      536      537      551      557      558      559
                                                   DEFINED      394      395
   4707  ICMP       INTEGER                           REFS      560  DEFINED      555
      0  ICNT       INTEGER              CNT          REFS       24      398      507      511      598
                                                   DEFINED      117      398
      2  ICOUNT     INTEGER              RESTR        REFS       45  DEFINED      384
      0  ID         INTEGER              DORK         REFS       26      339      340      358      369      380      381
                                                       385      386      397      508      525      530      540      544
                                                       566      596      605
      2  IDF        INTEGER              RODLOD       REFS       48
      0  IDR        INTEGER              RODLOD       REFS       48
      2  IDRY       INTEGER              SUBK         REFS       51
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         PROGRAM PAVE        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE     14

VARIABLES    SN  TYPE                RELOCATION
    2  IFLEXNA   INTEGER             BLOCKD         REFS       21
   12  IFSWIT    INTEGER   ARRAY     ABLK3          REFS       13      490      491      492  DEFINED      407      412
                                                    419      422      432      437      447      458      477      480
                                                    484
    0  IGINT     INTEGER             MXBLK          REFS       39
 4622  II        INTEGER                            REFS      162      163      164      166      168      169      171
                                                    173    2*239    2*241  DEFINED      161      235
 4623  IIBAD     INTEGER                            REFS      164      166      171      173  DEFINED      162      163
 4706  IIL       INTEGER                            REFS      555      556      560      561  DEFINED      555      556
                                                    560      561
    1  IIX       INTEGER   ARRAY     FMBLK          REFS       29      600      602  DEFINED      365      520      523
    0  IMAN      INTEGER             RDSTR          REFS       44      378      379      388      507
  620  IMIX      INTEGER             MIXBLK         REFS       38      122      153      155      170      177      191
                                                    198      207      208      212      218      234      309      314
    0  IREST     INTEGER             RESTR          REFS       45      360    2*361      399      503      509      510
                                                    513      514      516      517      527      532      541      545
                                                    567      571      576      585      597      607      611
                                                DEFINED      340
    3  IRIGDNA   INTEGER             BLOCKD         REFS       21      404    2*405      410      417      456    2*457
                                                    462      476      479
    0  IRL       INTEGER             BLBLK          REFS       17
    1  ITY       INTEGER             DOBK           REFS       26      340      342  DEFINED      361
    1  IUBC      INTEGER             SUBK           REFS       51
11574  IX        INTEGER   ARRAY                    REFS        9      512      523      560  DEFINED      555
 4614  J         INTEGER                            REFS      123      125      127      128      130      141      151
                                                    153      155    2*171    2*173      178      179      180      192
                                                    193      195      199      200      202      207      208      251
                                                    300      311      320      322      364      365    2*431    2*443
                                                  2*522    2*523      610      614  DEFINED      122      153      155
                                                    170      177      191      198      207      208      247      308
                                                    363      430      442      521      610      614
    0  JDL       INTEGER             SCAN3          REFS       49      368      391      397
 4635  JJ        INTEGER                            REFS      236      238    2*239      241      246      251      253
                                                    257      300    2*311    2*582    2*590    2*592
                                                DEFINED      234      309      580      589
    0  JMAN      INTEGER             MANLK          REFS       37
    1  JREST     INTEGER             RESTR          REFS       45
   26  JXX       INTEGER   ARRAY     MANLK          REFS       37
 4637  K         INTEGER                            REFS    2*249      250      251      300    2*311
                                                DEFINED      248      310
 4612  KBAD      INTEGER                            REFS      134      144  DEFINED      118      135      145
 4701  KCOST     INTEGER                            REFS      550  DEFINED      546      547      548      549
 4634  KK        INTEGER                            REFS      261      265      269      273      277      281      285
                                                    289      293      345      352      401      471      473      497
                                                    499    2*582    2*592  DEFINED      211      258      343      350
                                                    400      470      472      496      498      581      591
 4702  KKKL    * INTEGER                         DEFINED      550
    1  LFUNC     INTEGER             TYPBK          REFS       55
    0  LIMT      INTEGER             XMBLK          REFS       58  DEFINED      341      359      360
 4636  LL        INTEGER                         DEFINED      236      237
 4705  LLYR      INTEGER                            REFS      556      561  DEFINED      553      554
    0  LMH       INTEGER             TYPBK          REFS       55
   27  LS        INTEGER             LCY            REFS       33      212      213      220      222      224      228
                                                    229      235      303      314      316      319      321      327
                                                    332      335      343      350      400      430      442
    2  LT        INTEGER             IABLK          REFS       31  DEFINED      127
    0  LTT       INTEGER   ARRAY     LTTBLK         REFS       34      127
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            PROGRAM PAVE       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420          09/02/77  13.54.00         PAGE     15

  VARIABLES       SN  TYPE                 RELOCATION
        1 LZ          INTEGER                RODLOD     REFS        48       119       219       237       249       256       302
                                                         326
     4713 M           INTEGER                           REFS       599       600       601       602   DEFINED       598
     4700 MF          INTEGER                           REFS       528       542       570       574   DEFINED       528       542
                                                         570       574
        1 MLYST       INTEGER                MANLK      REFS        37       546       547       548       549
        0 MNT         INTEGER                DOM        REFS        27       182       183       186       187       188
                                                     DEFINED       180       218
        1 MNTO        INTEGER                SZBK       REFS        52       376       506
     4677 MQ          INTEGER                           REFS     2*528     2*542       569       570       573       574
                                                     DEFINED       528       542       569       570       573       574
     4653 MTN         INTEGER                           REFS       383   DEFINED       376       378       380
     4654 MTX         INTEGER                           REFS       383   DEFINED       377       379       381
        0 MXN         INTEGER                AMBLK      REFS        15
        0 MXTO        INTEGER                SZBK       REFS        52       377
      243 NB          INTEGER                LYTD       REFS        35       546       547       548       549
       51 NCOM        INTEGER                LYTD       REFS        35       519       554
        1 NFLEX       INTEGER                TYP        REFS        54       233
      145 NFSTRT      INTEGER                RLSVK      REFS        46     2*542       572       573       574       588       589
     4704 NKOM        INTEGER                           REFS       558   DEFINED       552
     4673 NLYR        INTEGER                           REFS       512       518       553       554       555       558       560
                                                     DEFINED       552
        0 NLYST       INTEGER                NANLK      REFS        40       546       547       548       549
        0 NNAT        INTEGER                LYTD       REFS        35
        5 NODQ        INTEGER                NBLK       REFS        41
        0 NOGQ        INTEGER                NBLK       REFS        41
        1 NOH         INTEGER                NBLK       REFS        41       121       153       155       157       158       161
                                                         207       208       209       210       211       212
                                                     DEFINED       157       158
     4621 NOI         INTEGER                           REFS       161   DEFINED       159       160
        2 NOO         INTEGER     ARRAY      RDSTR      REFS        44       390   DEFINED       373
     4655 NOOQ        INTEGER                           REFS       391   DEFINED       390
        6 NOSGQ       INTEGER                NBLK       REFS        41
        0 NPASS       INTEGER                PASSBK     REFS        42   DEFINED       511
        2 NPTQ        INTEGER                NBLK       REFS        41
     4703 NQLYR       INTEGER                           REFS       558   DEFINED       552
        0 NRIGID      INTEGER                TYP        REFS        54       120
      144 NRSTRT      INTEGER                RLSVK      REFS        46     2*528       568       569       570       579       580
      146 NSBB        INTEGER                LYTD       REFS        35
     4711 NSSTRT      INTEGER                           REFS       609       610   DEFINED       579
     4712 NTSTRT      INTEGER                           REFS       613       614   DEFINED       588
        1 NUMS        INTEGER                RDSTR      REFS        44       363       379   DEFINED       358       372
     4671 NX          INTEGER                           REFS       509       513       514       515       516       517       520
                                                        '522       523   DEFINED       506       507       508
        3 NXQ         INTEGER                NBLK       REFS        41
     4674 NXX         INTEGER                           REFS       519       520       521       601       602
                                                     DEFINED       518       519       600
        2 NYOO        INTEGER     ARRAY      MANLK      REFS        37
        4 NYQ         INTEGER                NBLK       REFS        41
       12 PAVT        REAL                   AKBLK      REFS        14       427       451       487   DEFINED       439
       16 PRDBTF      REAL                   BLOCKB     REFS        18
       20 PRDBTR      REAL                   BLOCKB     REFS        18
       17 PRFLTF      REAL                   BLOCKB     REFS        18
       21 PRFLTR      REAL                   BLOCKB     REFS        18
        0 PVTFLX      REAL                   BLOCKD     REFS        21       455
        1 PVTRGD      REAL                   BLOCKD     REFS        21       406       411       463       465
        0 RSTRT       REAL        ARRAY      RLSVK      REFS        45       528       569
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           PROGRAM PAVE        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    16

VARIABLES      SN TYPE              RELOCATION
   12  RSUBF     REAL            BLOCKB       REFS        18
   13  RSUBR     REAL            BLOCKB       REFS        18
   24  RTMO      REAL   ARRAY    RLSVK        REFS        46       528       570       582
    4  SLSDBTF   REAL            BLOCKB       REFS        18       455
    5  SLSDBTR   REAL            BLOCKB       REFS        18       406       463
    6  SLSPENF   REAL            BLOCKB       REFS        18
    7  SLSPENR   REAL            BLOCKB       REFS        18
11644  SSTRT     REAL   *UNDEF                REFS        10       609
11656  STMO      REAL   ARRAY                 REFS        10       610   DEFINED       582
 5274  STORE     REAL   ARRAY                 REFS         8       333   DEFINED       323
    0  STORE1    REAL   ARRAY    MIXBLK       REFS        38       128       178       179
  144  STORE2    REAL   ARRAY    MIXBLK       REFS        38       130
    0  SUBD      REAL            SUBK         REFS        51
 4670  SVCOST    REAL                         REFS       504       505       514       537   DEFINED       474       485
                                               500       535
 4642  TA        REAL                         REFS       252       254
 4664  TAKY      REAL                         REFS       441   DEFINED       429
 4661  TBIG      REAL                         REFS       434       435       438   DEFINED       426
   14  TBS       REAL            AKRLK        REFS        14       428       452       486   DEFINED       440
 5034  THF       REAL   ARRAY                 REFS         5       314
    0  THFF      REAL   ARRAY    THKBK        REFS        53       314       315       319       322       323       335
                                               351       352   DEFINED       317       333
  145  THK       REAL   ARRAY    FMBLK        REFS        29       601   DEFINED       364       509       516       517
                                               522
   12  TM        REAL   ARRAY    HBLK         REFS        30       344       345       351       352       401
11550  TMT       REAL   ARRAY                 REFS         9       512       522       561   DEFINED       556
 4662  TPAVT     REAL                         REFS       439   DEFINED       427
    0  TRA       REAL   ARRAY    BMBLK        REFS        22
   24  TRAA      REAL   ARRAY    BMBLK        REFS        22
 5010  TRK       REAL   ARRAY                 REFS         5       212
   24  TRKK      REAL   ARRAY    THKBK        REFS        53       212       214       222       225       228       230
                                               344       345       431   DEFINED       215       225       443
    0  TRPQZ     REAL   ARRAY    PQZ          REFS        43       401   DEFINED       230
    0  TRST      REAL            DMBLK        REFS        25
    2  TRY       REAL   ARRAY    LCY          REFS        33
11726  TSTRT     REAL   ARRAY                 REFS        10       613   DEFINED       590
 4660  TT        REAL                         REFS       401       420       424       433       448       460       461
                                               468       469       471       481       493       494       495       497
                                               504       505       509       517       537   DEFINED       451       460
                                               487       493       535
 4663  TTBS      REAL                         REFS       440   DEFINED       428
11740  TTMO      REAL   ARRAY                 REFS        10       614   DEFINED       592
 4764  TTRKK     REAL   ARRAY                 REFS         4       443   DEFINED       431
 4665  TTT       REAL                         REFS       469       495   DEFINED       461       494
    0  T1        REAL            T1BK         REFS        56       461       468       473       494       499       504
                                               505       537   DEFINED       402       452       469       486       495
                                               535
 4640  W         REAL                         REFS       255   DEFINED       250
  322  WHEELS    REAL   ARRAY    WES          REFS        57       257
 4644  WHHELS    REAL                         REFS       259       260       261       262       263       264       265
                                               266       267       268       269       270       271       272       273
                                               274       275       276       277       278       279       280       281
                                               282       283       284       285       286       287       288       289
                                               290       291       292       293       294   DEFINED       257
 4624  X         REAL                         REFS       169       215       225       254       323
                                           DEFINED       168       214       223       253       320
 4652  XAB       REAL                         REFS       369   DEFINED       368
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          PROGRAM PAVE        74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00        PAGE     17

VARIABLES       SN  TYPE              RELOCATION
     30  XCBR        REAL                   LCY         REFS        33      323
      0  XFP         REAL        ARRAY      SG5WP2      REFS        50   DEFINED      322
      7  XK          REAL                   NBLK        REFS        41
    147  XMT         REAL        ARRAY      LYTD        REFS        35
     31  XSTR        REAL                   LCY         REFS        33      128      130
     22  XTRA        REAL                   BLOCKB      REFS        18
   4620  XXA         REAL                               REFS       151   DEFINED      149      150
   4617  XXK         REAL                               REFS       141   DEFINED      139      140
   4651  XXO         REAL                               REFS       393   DEFINED      367      595
   4650  XXT         REAL                               REFS       345      346      347      348      352      353      354
                                                         355       369      371      385      393      401      512      526
                                                         595   DEFINED      347      348      354      355      370      387
                                                         389       391      397
   4615  X1          REAL                               REFS       131      132      133    2*139    2*140
                                                     DEFINED       128
   4616  X2          REAL                               REFS       131      143    2*149    2*150  DEFINED      130
   4641  Y           REAL                               REFS       252   DEFINED      251
      1  YCBR        REAL        ARRAY      LYTD        REFS        35
      1  YK          REAL                   LCY         REFS        33
   4633  Y1          REAL                               REFS       195      202  DEFINED      194      201
   4626  Y2          REAL                               REFS     2*189    2*194    2*201  DEFINED      184
   4627  Y3          REAL                               REFS       189      194      201  DEFINED      185
     52  ZCBR        REAL        ARRAY      LYTD        REFS        35
    244  ZMT         REAL        ARRAY      LYTD        REFS        35
   4630  Z1          REAL                               REFS       189   DEFINED      186
   4631  Z2          REAL                               REFS     2*189    2*194    2*201  DEFINED      187      192      199
   4632  Z3          REAL                               REFS       189      194      201  DEFINED      188      193      200

FILE NAMES          MODE
         TAPE5      UNFMT                    WRITES      504     READS      535      552      555      556
                                             MOTION      502       533      563
         TAPE6      FMT                      WRITES      131       132      136      146      153      155      207      208
                                                209      210       227      228      243      244      245      246      295
                                                313      319       335      344      346      351      353      371      404
                                                408      416       423      434      436      450      455      456      467
                                                468      482       505      568      569      570      572      573      574
                                                599      601       602      606      608      609      610      612      613
                                                614
         TAPE7      UNFMT                    WRITES      528       536      537      542      557      558      560      561
                                             MOTION      382
         TAPE8      FMT                      WRITES      490       491      492

EXTERNALS             TYPE    ARGS        REFERENCES
         ALOG10      REAL      1 LIBRARY      186      187       188      192      193      199      200
         RTCT                  1              420      424       433      448      481
         GINT                  6              261      265       269      273      277      281      285      289      293
                                              345      352       401
         LYR                   5              512
         MIXED                 8              212      314
         PECHART               2              252
         RODTHK                3              222
         SERCST                3              471      473       497      499
         SQRT        REAL      1 LIBRARY      205      215       254
         XMSTR                 3              526
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          PROGRAM PAVE       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE    18
INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
        ABS      REAL       1  INTRIN              323       393
        AINT     REAL       1  INTRIN              347       354       460       487       493
        FLOAT    REAL       1  INTRIN              368       387       391       397
        RCOVHI   REAL       1     SF     75        140       150
        RCOVLO   REAL       1     SF     74        139       149

STATEMENT LABELS             DEF LINE   REFERENCES
  174  1                       152       121       122       137       142       147
 2152  2                       445       403       410       418
 2212  3                       459       478
 2234  4                       465       462
 2240  5                       466       464
    0  6                       301       234       247       248
 1523  7                       336       233
    0  13          INACTIVE    134       133
  103  14                      138       2*133
    0  15          INACTIVE    144       143
  147  16                      148       2*143
    0  17                      431       430
 2164  18                      449       421       425       435       444
    0  19                      443       442
 1672  20                      375       369
 1311  21                      298       260       262       264       266       268       270       272       274       276
                                         278       280       282       284       286       288       290       292       294
 1305  22                      297       256
    0  25                      216       213
  613  26                      217       119
    0  27                      242       235
 1605  28                      357       339
 3151  30                      595       383       566      2*586
    0  31                      524       521
 1564  32                      350       342
    0  33                      366       362       363
 1362  35                      307       302
 1504  36                      331       326
  644  38                      226       219
    0  40                      225       224
 1753  53                      392       388
    0  60                      324       321
    0  61                      221       220
    0  70                      325       306
 2033  71                      410       405
 2047  72                      415       409       413
    0  73          INACTIVE    414
 2065  74                      422       417
 2650  85                      545       540
 2521  86                      525       510
 2266  87                      476       457
 2274  89                      479       475       476
 2524  90                      526       386       396
    0  91          INACTIVE    578       577
 3114  92                      585       2*577
    0  93                      583       580       581
    0  94          INACTIVE    587       586
    0  95                      593       589       591
  331  100                     174       161       170       172
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          PROGRAM PAVE        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE    19

STATEMENT LABELS                    DEF LINE   REFERENCES
  2325   124                           489        454
   665   125                           232        120
     0   200                           312        309        310
     0   253                           231        229
     0   300                           603        598
  2754   302                           562        550        559
     0   350                           306        303
     0   351                           330        327
  2564   400                           531        525
     0   401            INACTIVE       546
  2607   402                           539        530
  2763   403                           565        544
  1645   404                           367        349        356
  3224   405                           605        596
  3323   406                           615        605        611
  2375   407                           501        399        479        483        488
  2430   408                           510        503
  2606   409                           538        532
  2762   410                           564        545
  3223   411                           604        597
  2560   412                           529        527
  2644   413                           543        541
  3024   414                           571        567
  3061   415                           575        571
  3113   416                           584        576
  3150   417                           594        585
  3266   418                           611        607
  1423   419                           318        315
     0   420                           317        316
    37   430                           126        124
    62   431                           132        129
   244   432                           156        154
   301   433                           167        165
  2173   441                           453        446
  2577   610                           536        534
  2726   620                           557        551
   521   650                           206        175
     0   660                           196        191
     0   770                           334        332
   362   800                           181        177        178
   515   810                           204        197
     0   820                           203        198
  3550  1008        FMT                 76        404
  3554  1009        FMT                 77        416
  3560  1010        FMT                 78        455
  3567  1097        FMT                 79        490
  3600  1098        FMT                 81        491
  3610  1099        FMT                 83        492
  3621  1101        FMT                 85        456
  3625  1102        FMT                 86        467
  3631  1103        FMT                 87        468
  3637  1104        FMT                 88        482
  3644  1717        FMT                 89        344
  3650  1718        FMT                 90        346        353
  3654  1821        FMT                 91        408
  3660  1822        FMT                 92        423
  3664  1823        FMT                 93        436
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          PROGRAM PAVE        74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00        PAGE    20

STATEMENT LABELS                    DEF LINE    REFERENCES
  3670  1824      FMT                   94       450
  3674  1825      FMT                   95       434
  3701  2000      FMT                   96       505      569      570      573      574      609      610      613      614
  3703  2100      FMT                   97       371
  3714  2500      FMT   NO REFS         99
  3723  2727      FMT                  100       351
  3727  3000      FMT                  101       228      313      319      335
  3731  5000      FMT                  102       568      572
  3733  6000      FMT                  103       227
  3740  7000      FMT                  104       131      132      153      155      207      208      209      210      244
                                                 245      246
  3743  7250      FMT                  105       599
  3753  7500      FMT                  107       606
  3761  8000      FMT   NO REFS        108
  3766  8250      FMT                  109       601
  3772  8500      FMT                  110       608
  3776  9000      FMT                  111       602
  4002  9122      FMT                  112       295
  4010  9500      FMT                  113       612
  4015  9600      FMT                  114       136      146
  4021  9700      FMT                  115       243

LOOPS  LABEL     INDEX         FROM-TO     LENGTH     PROPERTIES
    21  1        * I          121 152     161B               EXT REFS  NOT INNER
    23  1        * J          122 152     154B               EXT REFS
   205           * I          153 153      12B               EXT REFS
   227           * I          155 155      12B               EXT REFS
   261  100      * II         161 174      56B               NOT INNER
   311  100        J          170 174      23B        OPT
   345  800        J          177 181      20B        OPT
   433  660      * J          191 196      26B               EXT REFS
   466  820      * J          198 203      26B               EXT REFS
   524           * I          207 207      12B               EXT REFS
   543           * I          208 208      12B               EXT REFS
   601  25       * I          213 216      11B               EXT REFS
   622  61         I          220 221       6B     INSTACK
   636  40         I          224 225       5B     INSTACK
   656  253        I          229 231       6B     INSTACK
   671  6        * JJ         234 301     445B               EXT REFS  NOT INNER
   673  27         II         235 242      30B        OPT
   734           * I          246 246      11B               EXT REFS
   751  6        * J          247 301     362B               EXT REFS  NOT INNER
   753  6        * K          248 301     355B               EXT REFS
  1343  250        I          303 306      16B        OPT
  1364  70       * J          308 325      74B               EXT REFS  NOT INNER
  1366  200      * JJ         309 312      16B               NOT INNER
  1370  200        K          310 312      11B        OPT
  1415  420        I          316 317       5B     INSTACK
  1436  60         I          321 324      17B        OPT
  1465  351        I          327 330      16B        OPT
  1506  770        I          332 334       6B     INSTACK
  1624  33       * I          362 366      20B               NOT INNER
  1626  33         J          363 366      13B        OPT
  1722  30       * I          383 595    1233B               EXT REFS  NOT INNER
  2107  17         J          430 431       5B     INSTACK
  2143  19         J          442 443       5B     INSTACK
  2503  31         J          521 524      15B        OPT
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          PROGRAM PAVE        74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420         09/02/77  13.54.00        PAGE    21

LOOPS  LABEL    INDEX        FROM-TO    LENGTH   PROPERTIES
 2534           * MO         528 528     21B              EXT REFS  NOT INNER
 2541           * MF         528 528     11B              EXT REFS
 2620           * MO         542 542     21B              EXT REFS  NOT INNER
 2625           * MF         542 542     11B              EXT REFS
 2675   302     * KKKL       550 562     62B              EXT REFS
 3004           * MO         570 570     15B              EXT REFS  NOT INNER
 3005           * MF         570 570     11B              EXT REFS
 3041           * MO         574 574     15B              EXT REFS  NOT INNER
 3042           * MF         574 574     11B              EXT REFS
 3075   93      * JJ         580 583     15B              NOT INNER
 3077   93        KK         581 583     10B        OPT
 3127   95      * JJ         589 593     20B              NOT INNER
 3134   95        KK         591 593     10B        OPT
 3165   300     * M          598 603     35B              EXT REFS
 3246           * I          610 610     15B              EXT REFS  NOT INNER
 3247           * J          610 610     11B              EXT REFS
 3303           * I          614 614     15B              EXT REFS  NOT INNER
 3304           * J          614 614     11B              EXT REFS

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       ABLK3         20                  0 AKEFT   (10)          10 IFSWIT (10)
       AKBLK         14                  0 AKEF    (10)          10 PAVT    (1)          11 BIG     (1)
                                        12 TBS     (1)           13 AKY     (1)
       AMBLK          2                  0 MXN     (1)            1 IBN     (1)
       ARBK           1                  0 AREA    (1)
       BLBLK          1                  0 IRL     (1)
       BLOCKB        19                  0 COMPF   (1)            1 COMPR   (1)           2 FCOMPF  (1)
                                         3 FCOMPR  (1)            4 SLSDBTF (1)           5 SLSDBTR (1)
                                         6 SLSPENF (1)            7 SLSPENR (1)           8 FLSF    (1)
                                         9 FLSR    (1)           10 RSUBF   (1)          11 RSUBR   (1)
                                        12 FRSUBF  (1)           13 FRSUBR  (1)          14 PRDBTF  (1)
                                        15 PRFLTF  (1)           16 PRDBTR  (1)          17 PRFLTR  (1)
                                        18 XTRA    (1)
       BLOCKD         4                  0 PVTFLX  (1)            1 PVTRGD  (1)           2 IFLEXNA (1)
                                         3 IRIGONA (1)
       BMBLK         40                  0 TRA     (20)          20 TRAA    (20)
       BSBLK          4                  0 IBTE    (1)            1 FDE     (1)           2 BTE     (1)
                                         3 GBM     (1)
       CNT            1                  0 ICNT    (1)
       DMBLK          1                  0 TRST    (1)
       DOBK           4                  0 ID      (1)            1 ITY     (1)           2 DT2Q    (1)
                                         3 DT      (1)
       DOM            1                  0 MNT     (1)
       EMBLK        100                  0 FAIL2   (100)
       FMBLK        201                  0 DHD     (1)            1 IIX     (100)       101 THK     (100)
       HBLK          40                  0 HH      (10)          10 TM      (20)         30 AHH     (10)
       IABLK          4                  0 FACC    (1)            1 FACN    (1)           2 LT      (1)
                                         3 IA      (1)
       KAYBK          1                  0 IAXK    (1)
       LCY           26                  0 AXK     (1)            1 YK      (1)           2 TRY     (20)
                                        22 FAC     (1)           23 LS      (1)          24 XCBR    (1)
                                        25 XSTR    (1)
       LTTBLK        20                  0 LTT     (10)          10 IAA     (10)
       LYTD         176                  0 NNAT    (1)            1 YCBR    (40)         41 NCOM    (1)
                                        42 ZCBR    (60)         102 NSBB    (1)         103 XMT     (60)
                                       163 NB      (1)          164 ZMT     (12)
       MANLK        422                  0 JMAN    (1)            1 MLYST   (1)           2 NYOO    (20)
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      PROGRAM PAVE        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420          09/02/77  13.54.00        PAGE    22

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
                                 22 JXX     (400)
       MIXBLK      401            0 STORE1  (100)           100 STORE2  (100)           200 COVRGD  (200)
                                400 IMIX    (1)
       MXRLK         2            0 IGINT   (1)               1 ICBR    (1)
       NANLK         1            0 NLYST   (1)
       NBLK          8            0 NOGQ    (1)               1 NOH     (1)               2 NPTQ    (1)
                                  3 NXQ     (1)               4 NYQ     (1)               5 NODQ    (1)
                                  6 NOSGQ   (1)               7 XK      (1)
       PASSRK        1            0 NPASS   (1)
       POZ          20            0 TRPQZ   (20)
       RDSTR        72            0 IMAN    (1)               1 NUMS    (1)               2 NOO     (10)
                                 12 CSTRT   (60)
       RESTR         3            0 IREST   (1)               1 JREST   (1)               2 ICOUNT  (1)
       PLSVK       102            0 RSTRT   (10)             10 FSTRT   (10)             20 RTMO    (40)
                                 60 FTMO    (40)            100 NRSTRT  (1)             101 NFSTRT  (1)
       RODLOD        3            0 IDR     (1)               1 LZ      (1)               2 IDF     (1)
       SCAN3         1            0 JDL     (1)
       SG5WP2      200            0 XFP     (200)
       SUBK          3            0 SUBD    (1)               1 IUBC    (1)               2 IDRY    (1)
       SZBK          2            0 MXTO    (1)               1 MNTO    (1)
       THKBK        40            0 THFF    (20)             20 THKK    (20)
       TYP           2            0 NRIGID  (1)               1 NFLEX   (1)
       TYPBK         2            0 LMH     (1)               1 LFUNC   (1)
       T1BK          1            0 T1      (1)
       WES         240            0 ESWL    (200)           200 AESWL   (10)            210 WHEELS  (10)
                                220 CBR     (20)
       XMBLK         1            0 LIMT    (1)

STATISTICS
  PROGRAM LENGTH                 121448    5220
  CM LABELED COMMON LENGTH        42378    2207
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      SUBROUTINE LYR(XXT,TMT,CDF,IX,NLYR)
      DIMENSION YMT(20),DPTH(20),TMT(20),IX(20),
     1XTMT(20),IXT(20)
      DIMENSION NCST(20)
      DIMENSION IY(20)
      DIMENSION NX(20)
      COMMON /ARBK/ AREA
      COMMON /HSBLK/ IRTE,FDE
      COMMON/HSBLK2/FDEF
      COMMON /CEYVAL/ MX(20)
      COMMON /DOBK/ ID,ITY,DT2Q,DT
      COMMON /GLINK/ JJMN
      COMMON /HBLK/ HHQ(10),TM(20)
      COMMON /KEYVAL/ KX(20)
      COMMON /LCY/ AXKQ,YKQ,TRYQ(20),FACQ,LS,XCBR
      COMMON /LYTD/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSBB,XMT(10,6),
     1NB,ZMT(3,4)
      COMMON /MANLK/ JMAN,MLYST,NYOO(20),JXX(20,20)
      COMMON/MXBLK/IGINT,ICBR
      COMMON /NANLK/ NLYST
      COMMON /PASSCK/ LPASS
      COMMON /RODLOD/ IDR,LZ,IDF
      COMMON /SG5WP2/ XFP(20,10)
      COMMON /SUBK/ SUBD,IUBC,IDRY
      COMMON /S7BK/ MXTO,MNTO
      COMMON /THKBK/ THFF(20)
      COMMON /TYPBK/ LMH,LFUNC
      COMMON/WES/ESWL(10,20),AESWL(10),WHEELS(10),CBR(20)
      DATA MPASS/0/,LPASS/1/
 1000 FORMAT(2X,10(2X,I2))
2000  FORMAT(" FDEF = ",2X,10F10.2)
 3000 FORMAT(2X,6F10.0)
      IY(1)=IUBC
      IF(IRTE.EQ.4)  FDEF=FDE
      XCD=1000000000.
      NQBB=NSBB
      NKOM=NCOM
      JJMN=0
      LX=LS
      CALL GINT(THFF,TM,XXT,TZZ,LX,20)
      TDRY=TZZ*.8
      IF(NNAT.EQ.0) GO TO 1
      DO 2 I=1,NNAT
      YMT(I)=YCBR(I,1)
      IY(I+1)=INT(YCBR(I,4)+.1)
      WRITE(6,1000) IY(I+1),I
 2    CONTINUE
 1    CONTINUE
      JJMN=JJMN+1
      NSBB=0
      IF(NCOM.GT.0) NSBB=NCOM+NQBB-1
      IF(NCOM.EQ.0) NSBB=NQBB
      NCOM=1
      IF(NKOM.EQ.0) NCOM=0
      IF(JMAN.EQ.2) GO TO 101
      IF(NSBB.EQ.0) GO TO 81
      IF(NQBB.EQ.0) GO TO 81
      CALL GXMT(NQBB,NQLYR)
81    IF((NQBB.EQ.0).A.(JJMN.EQ.1)) NQLYR=1
      IF((NQBB.EQ.0).A.(JJMN.EQ.2)) NQLYR=0
      MPASS=MPASS+1
      IF(MPASS.GT.1) LPASS=2
      WRITE(6,1000) NQBB,NQLYR
      DO 100 KL=1,NQLYR
      IX(KL)=KX(KL)
      WRITE(6,1000) KL,IX(KL)
100   CONTINUE
      GO TO 102
101   IF((JMAN.EQ.2).AND.(JJMN.EQ.MLYST+1)) GO TO 4
      NQLYR=NYOO(JJMN)
      DO 103 JJKM=1,NQLYR
      IX(JJKM)=JXX(JJMN,JJKM)
103   CONTINUE
102   CONTINUE
      IF((JMAN.EQ.1).A.(NQLYR.EQ.0)) MLYST=JJMN-1
      IF((JMAN.EQ.1).A.(NQLYR.EQ.0)) GO TO 4
      IQCMP=0
603   IQCMP=IQCMP+1
      IF(NCOM.EQ.0) GO TO 83
      CALL GZCBR(NKOM,NCLYR)
      IF((NKOM.NE.0).A.(NCLYR.EQ.0)) NLYST=IQCMP-1
      IF((NKOM.NE.0).A.(NCLYR.EQ.0)) GO TO 605
      NLYR=NCLYR+NQLYR-1
      IF(NQBB.EQ.0) NLYR=NCLYR-1
      NXLY=NLYR
      NKLYR=NCLYR-1
      DO 600 ML=1,NLYR
      NL=ML+1
      IF(ML.GT.NKLYR) GO TO 601
      NX(ML)=MX(NL)
      GO TO 600
601   NX(ML)=KX(ML-NKLYR)
600   CONTINUE
      ICMP=MX(1)
      DO 602 ML=1,NLYR
      IX(ML)=NX(ML)
      WRITE(6,1000) ML,IX(ML)
602   CONTINUE
      IF(NCOM.EQ.0) GO TO 83
      YMT(NNAT+1)=ZCBR(ICMP,1)
      IY(NNAT+2)=INT(ZCBR(ICMP,4)+.1)
      WRITE(6,1000) IY(NNAT+2),NNAT
83    CONTINUE
      IF((NKOM.EQ.0).A.(NQBB.EQ.0)) NLYR=0
      IF((NKOM.EQ.0).A.(NQBB.GT.0)) NLYR=NQLYR
      IF(NKOM.EQ.0) NXLY=NQLYR
      IF(NKOM.EQ.0) NKLYR=0
      IF(NLYR.EQ.0) GO TO 84
      DO 70 I=1,NLYR
      II=NNAT+1+I
      IF(NCOM.EQ.0) II=II-1
      JJ=IX(I)
      IF(I.GT.NKLYR) GO TO 604
      YMT(II)=ZCBR(JJ,1)
      IY(II+1)=INT(ZCBR(JJ,4)+.1)
      WRITE(6,1000) IY(II+1),II
      GO TO 70
604   YMT(II)=XMT(JJ,1)
      IY(II+1)=INT(XMT(JJ,4)+.1)
      WRITE(6,1000) IY(II+1),II
70    CONTINUE
84    CONTINUE
      DO 5 IBAS=1,NB
      IF(ZMT(IBAS,1).GE.50.) IBASE=3
      IF(ZMT(IBAS,1).GT.70.) IBASE=2
      IF(ZMT(IBAS,1).GT.90.) IBASE=1
      LL=NNAT+2+NLYR
      IF(NCOM.EQ.0) LL=LL-1
      YMT(LL)=ZMT(IBAS,1)
      IY(LL+1)=INT(ZMT(IBAS,4)+.1)
      LL1=LL+1
      IXXC=0
      DO 7 I=1,LL1
      IYSC=LL-I+2
      IF((IY(IYSC).EQ.3).OR.(IY(IYSC).EQ.4))GO TO 8
7     CONTINUE
8     IXXC=IYSC
      WRITE(6,2000) (YMT(KL),KL=1,LL)
      WRITE(6,1000) (IY(KL),KL=1,LL)
      DENS=SUHD
      IOH=IUBC
      IDENS=0
      DO 75 J=1,5
      DN=105.-5.*FLOAT(J)
      IF(DENS-DN) 73,74,74
74    IDENS=IDENS+1
73    CONTINUE
75    CONTINUE
      IDENS=6-IDENS
      IDENT=IDENS-1
      IF(IDENS.EQ.6)IDENS=5
      IF(IDENT.EQ.0)IDENT=1
      WRITE(6,2000) TZZ,TXX,TYY,FDE,FDEF
      IF((IXXC.EQ.1).A.(FDEF.GT.TZZ))  TZZ=FDEF
      TXX=TZZ
      IF(LZ.EQ.3)GO TO 9
      CALL TLMC(LMH,LFUNC,IOH,IDENS,IDENT,DENS,TYY)
      GO TO 10
9     CALL RODDENS(IDF,DENS,IOH,TYY)
10    CONTINUE
      IF(TYY.LT.TXX) GO TO 72
      TXX=TYY
      TDRY=0.
72    CONTINUE
      IXXC=IXXC-1
      DO 6 I=1,LL
      XXR=YMT(I)
      IF(I.LT.LL) XRR=YMT(I+1)
      KK=LL-1
      IF(KK.EQ.0) GO TO 85
      GO TO 86
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 85   ISB=2
      IF(XCHR.LE.79.9) ISB=1
      GO TO 52
 86   CONTINUE
      IF(I.EQ.KK) GO TO 20
      GO TO 21
 20   IF(XXR-79.9) 22,22,23
 22   ISB=1
      GO TO 21
 23   ISB=2
 21   CONTINUE
      IF(I.GT.KK) GO TO 52
      IF(XXR-49.9) 24,24,25
 25   XXR=50.
 24   CONTINUE
 52   CONTINUE
      LY=ICBR
      CALL HINT(TX,XXT,XXR,LX,LY,TM,LS)
      WRITE(6,2000) TX,FDE,FDEF
      WRITE(6,1000) IXXC
      IF((IXXC.EQ.1).A.(FDEF.GT.TX))    TX=FDEF
      WRITE(6,2000) TX,FDE,FDEF
      WRITE(6,1000) IXXC
      IF(I.GT.NNAT) GO TO 26
      JXMT=0
      IF(I.LT.NNAT) GO TO 338
      IF(NCOM.EQ.0) GO TO 343
      DENS=ZCBR(ICMP,2)
      IOH=INT(ZCBR(ICMP,4)+.1)
      GO TO 351
343   IF(NSBR.EQ.0) GO TO 30
      DENS=XMT(IX(1),2)
      JXMT=1
      IOH=INT(XMT(IX(1),4)+.1)
      GO TO 351
338   DENS=YCBR(I+1,2)
      IOH=INT(YCBR(I+1,4)+.1)
351   CONTINUE
      THH=YCBR(I,3)
      IDENS=0
      DO 71 J=1,5
      DN=105.-5.*FLOAT(J)
      IF(DENS-DN) 27,29,29
 29   IDENS=IDENS+1
 27   CONTINUE
 71   CONTINUE
      IDENS=6-IDENS
      IDENT=IDENS-1
      IF(IDENS.EQ.6)IDENS=5
      IF(IDENT.EQ.0)IDENT=1
      IF((JXMT.EQ.1).AND.(XRR.GE.20.)) GO TO 30
      IF(LZ.EQ.3)GO TO 11
      CALL TLMC(LMH,LFUNC,IOH,IDENS,IDENT,DENS,TLIM)
      GO TO 12
 11   CALL RODDENS(IDF,DENS,IOH,TLIM)
 12   CONTINUE
      IF(TLIM-TX) 30,31,31
 31   TX=TLIM
 30   CONTINUE
      IF(I.GT.1) GO TO 32
      TAX=TXX
      GO TO 37
 32   TAX=DPTH(I-1)
 37   IF(TAX-TX-THH) 33,34,34
 34   TX=TAX-THH
      GO TO 35
 33   IF(I.GT.1) GO TO 36
      TXX=TX+THH
      GO TO 35
 36   TFOB=TX+THH-TAX
      KK=I-1
      DO 39 J=1,KK
      DPTH(J)=DPTH(J)+TFOB
 39   CONTINUE
      TXX=TXX+TFOB
 35   CONTINUE
      DPTH(I)=TX
      GO TO 6
 26   CONTINUE
      IF(KK.EQ.0) GO TO 40
      KK=NNAT+NLYR+1
      IF(NCOM.EQ.0) KK=KK-1
      IF(I.GT.KK) GO TO 40
      KK=NNAT+1
      IF(NCOM.EQ.0) KK=KK-1
      JXMT=0
      IF(I.GT.KK) GO TO 42
      NCST(I)=7+ICMP
      IF(NSBR.EQ.0) GO TO 45
      DENS=XMT(IX(1),2)
      IOH=INT(XMT(IX(1),4)+.1)
      IF(NKOM.LE.1) JXMT=1
      IF(NKOM.GT.1) DENS=ZCBR(IX(1),2)
      IF(NKOM.GT.1) IOH=INT(ZCBR(IX(1),4)+.1)
      GO TO 41
 42   CONTINUE
      KK=IX(I-1-NNAT)
      IF(NCOM.EQ.0) KK=IX(I-NNAT)
      NCST(I)=NKOM+7+KK
      IF((I-1-NNAT).LT.(NKLYR)) NCST(I)=7+KK
      DENS=XMT(KK,2)
      IOH=INT(XMT(KK,4)+.1)
      IF(KK.GE.NKLYR) JXMT=1
      IF(KK.LT.NKLYR) DENS=ZCBR(KK,2)
      IF(KK.LT.NKLYR) IOH=INT(ZCBR(KK,4)+.1)
 41   CONTINUE
      IF((JXMT.EQ.1).A.(XRR.GE.20.)) GO TO 45
      IF(XRR.GE.20.) GO TO 45
      IDENS=0
      DO 43 J=1,5
      DN=105.-5.*FLOAT(J)
      IF(DENS-DN) 43,44,44
 44   IDENS=IDENS+1
 43   CONTINUE
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```
      IDENS=6-IDENS
      IDENT=IDENS-1
      IF(IDENS.EQ.6)IDENS=5
      IF(IDENT.EQ.0)IDENT=1
      IF(LZ.EQ.3)GO TO 13
      CALL TLMC(LMH,LFUNC,IOH,IDENS,IDENT,DENS,TLIM)
      GO TO 14
   13 CALL RODDENS(IDF,DENS,IOH,TLIM)
   14 CONTINUE
      IF(TLIM-TX) 45,46,46
   46 TX=TLIM
   45 CONTINUE
      DPTH(I)=TX
      GO TO 6
   40 CONTINUE
      NCST(I)=NCOM+NSBB+7+IBAS
      IPHQ=2
      IF(LZ.NE.3)GO TO 15
      KLASS=LFUNC
      IF(IBASE.EQ.1)CBRL=100.
      IF(IBASE.EQ.2)CBRL=80.
      IF(IBASE.EQ.3)CBRL=50.
      CALL MTHICK(IDF,CBRL,THIKENS,KLASS,BASET)
      TLMB=BASET
      IPBQ=1
      TLIM=THIKENS
      GO TO 16
   15 CONTINUE
      CALL TLMM(LMH,LFUNC,IBASE,ISB,IPBQ,TLIM)
      TLMB=TLIM
      IPBQ=1
      CALL TLMM(LMH,LFUNC,IBASE,ISB,IPBQ,TLIM)
   16 CONTINUE
      IF(TLIM.LT.TX) TLIM=TX
      IF(I.NE.1) GO TO 88
      TMLB=TXX
      GO TO 87
   88 TMLB=DPTH(I-1)
   87 IF(TLIM+TLMB-TMLB) 48,48,47
   47 IF(I.EQ.1) GO TO 53
      DPTH(I-1)=TLIM+TLMB
      GO TO 48
   53 TXX=TLIM+TLMB
   48 TX=TLIM
      DPTH(I)=TLIM
    6 CONTINUE
      WRITE(6,2000) (DPTH(KL),KL=1,LL)
      WRITE(6,2000) TXX
C
C     ASSIGNING LAYER THICKNESSES FROM TOP TO BOTTOM.
C
C        "TDRY" IS SUBTRACTED FROM LOWEST SUBBASE IF CLIMATE IS DRY.
C        IF A SUBBASE OR COMPACTED SUBGRADE LAYER IS INCREASED BY "DIFF"
C        DUE TO MINIMUM THICKNESS REQUIREMENTS, THE LAYER BELOW IS
C        DECREASED BY "DIFF."
C        THE FINAL "CDF" IS THE COST OF THE SCHEME.
C
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   68 MM=NLYR+3
      IF(NCOM.EQ.0) MM=MM-1
      DIFF=0.
      DO 56 I=1,MM
      L=MM-I+1
      J=L+NNAT
      THH=0.
      TX=TXX
      IF(NNAT.EQ.0) GO TO 92
      DO 57 K=1,NNAT
      THH=THH+YCBR(K,3)
   57 CONTINUE
      TX=TXX-THH
   92 CONTINUE
      IF(TDRY.GT.1.) TDRY=.2*TX
C
C     PAVEMENT
C
      IF(I.GT.1) GO TO 58
      TMT(MM)=DPTH(J-1)
      TMT(MM)=AINT(TMT(MM)+.74)
      TTT=TMT(MM)
      CALL SERCST(3,TTT,CDF)
      GO TO 56
C
C     BASE (ROADS)
C
   58 KK=NLYR+2
      IF(NCOM.EQ.0) KK=KK-1
      IF(L.LT.KK) GO TO 55
      IF((L.EQ.KK).AND.(LZ.NE.3)) GO TO 55
      TMT(L)=DPTH(J-1)-DPTH(J)
      TMT(L)=AINT(TMT(L)+.74)
      IF(TMT(L).LT.4.) TMT(L)=4.
      NCALL=NCST(J)
      TTT=TMT(L)
      CALL SERCST(NCALL,TTT,CDF1)
      CDF=CDF+CDF1
      GO TO 56
C
C     BASE (AIRFIELDS), SUBBASES, OR COMPACTED SUBGRADE LAYERS
C
   55 IF(L.EQ.1) GO TO 59
      TMT(L)=DPTH(J-1)-DPTH(J)-DIFF
      DIFF=0.
      KK=2+NKLYR
      IF(NCOM.EQ.0) KK=1
      IF((J.EQ.KK).AND.(IDRY.EQ.2)) TMT(L)=TMT(L)-TDRY
      IF(TMT(L).LT.6.) DIFF=6.-TMT(L)
      TMT(L)=AINT(TMT(L)+.74)
      IF(TMT(L).LT.6.) TMT(L)=6.
      NCALL=NCST(J)
      TTT=TMT(L)
      CALL SERCST(NCALL,TTT,CDF1)
      CDF=CDF+CDF1
      GO TO 56
C
```

```
      C     BOTTOM LAYER, IF SUBBASE OR COMPACTED SUBGRADE
      C
       59   TMT(1)=TX-DPTH(J)-DIFF
            IF((NCOM.EQ.0).A.(IDRY.EQ.2)) TMT(1)=TMT(1)-TDRY
            TMT(1)=AINT(TMT(1)+.74)
            IF(TMT(1).LT.6.) TMT(1)=6.
            NCALL=NCST(J)
            TTT=TMT(1)
            CALL SERCST(NCALL,TTT,CDF2)
            CDF=CDF+CDF2
       56   CONTINUE
            CDF=CDF*AREA
            WRITE(6,1000) NLYR
            LLYR=NLYR+3
            IF(NCOM.EQ.0) LLYR=NLYR+2
            WRITE(6,2000) CDF,(TMT(IIL),IIL=1,LLYR)
            WRITE(6,2000) (IX(IIL),IIL=1,NXLY),ICMP,IBASE
            WRITE(5) NLYR,NQLYR,NKOM
            WRITE(5) (IX(IIL),IIL=1,NXLY),ICMP,IBAS
            WRITE(5) CDF,(TMT(IIL),IIL=1,LLYR)
            WRITE(6,2000) CDF
            WRITE(6,1000) NLYR
            WRITE(6,1000) (IX(M),M=1,NXLY)
            MA=NLYR+3
            IF(NCOM.EQ.0) MA=MA-1
            WRITE(6,2000) (TMT(M),M=1,MA)
            IF(XCD-CDF) 60,61,61
       61   XCD=CDF
            KK=NLYR+3
            IF(NCOM.EQ.0) KK=KK-1
            DO 62 I=1,KK
            XTMT(I)=TMT(I)
            IF(I.GT.NLYR) GO TO 62
            IXT(I)=IX(I)
       62   CONTINUE
            IXBS=IBAS
            IXCMP=ICMP
            IXSB=ISB
       60   CONTINUE
       5    CONTINUE
            IF(NCOM.EQ.0) GO TO 605
       3    GO TO 603
       605  CONTINUE
            IF(NCOM.EQ.0) NLYST=0
            GO TO 1
       4    CONTINUE
            KK=NXLY+3
            IF(NCOM.EQ.0) KK=KK-1
            DO 63 I=1,KK
            TMT(I)=XTMT(I)
            LL=NXLY+1
            IF(I.EQ.LL) GO TO 66
            LL=NXLY+2
            IF((I.EQ.LL).AND.(NCOM.GT.0)) GO TO 65
            LL=NXLY+3
            IF(NCOM.EQ.0) LL=LL-1
            IF(I.EQ.LL) GO TO 67
```

```
                        IX(I)=IXT(I)
                        GO TO 63
                   66   IX(I)=IXBS
    460                 GO TO 63
                   65   IX(I)=IXCMP
                        GO TO 63
                   67   IX(I)=IXSB
                   63   CONTINUE
    465                 NLYR=NXLY
                        CDF=XCD
                        WRITE(6,3000) CDF
                        WRITE(6,1000) NLYR
                        REWIND 5
    470                 NSBB=NQBB
                        NCOM=NKOM
                        RETURN
                        END
```

```
      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     4  LYR             1         472

 VARIABLES      SN  TYPE            RELOCATION
   310  AESWL       REAL       ARRAY    WES          REFS        28
     0  AREA        REAL                ARBK         REFS         7       411
     0  AXKQ        REAL                LCY          REFS        15
  2720  BASET       REAL                             REFS       308       309
   334  CBR         REAL       ARRAY    WES          REFS        28
  2716  CBRL        REAL                             REFS       308   DEFINED       305       306       307
     0  CDF         REAL                    F.P.     REFS       365       380       397       409       411       415       419
                                                      420       426       427       467   DEFINED         1       380       397
                                                      409       411       466
  2731  CDF1        REAL                             REFS       379       380       396       397
  2732  CDF2        REAL                             REFS       408       409
  2671  DENS        REAL                             REFS       145       157       159       214       224       226       283
                                                      291       293   DEFINED       140       199       203       207       261
                                                      264       272       275
  2724  DIFF        REAL                             REFS       386       402   DEFINED       345       387       391
  2675  DN          REAL                             REFS       145       214       283   DEFINED       144       213       282
  2766  DPTH        REAL       ARRAY                 REFS         2       234       244       323       332       362     2*374
                                                    2*386       402   DEFINED       244       248       298       326       330
     3  DT          REAL                DOBK         REFS        11
     2  DT2Q        REAL                DOBK         REFS        11
     0  ESWL        REAL       ARRAY    WES          REFS        28
    26  FACQ        REAL                LCY          REFS        15
     1  FDE         REAL                BSBLK        REFS         8        34       153       190       193
     0  FDEF        REAL                BSBLK2       REFS         9       153     2*154       190     2*192       193
                                                  DEFINED        34
     0  HHQ         REAL       ARRAY    HBLK         REFS        13
  2646  I           INTEGER                          REFS      2*44      2*45      2*46       110       112       113       134
                                                      167     2*168       176       183       192       195       197       207
                                                      208       210       231       234       238       242       248       254
      SUBROUTINE LYR        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE     10
VARIABLES      SN  TYPE            RELOCATION
                                                   258       259       268       269       270     2*271       298       301
                                                   320       323       325       326       330       347       361     2*431
                                                   432     2*433     2*449       451       453       456     2*457       459
                                                   461       463   DEFINED        43       109       133       166       346
                                                   430       448
  2663  IBAS    INTEGER                           REFS       124       125       126       129       130       301       418
                                                   435   DEFINED       123
  2664  IBASE   INTEGER                           REFS       305       306       307       314       317       416
                                               DEFINED       124       125       126
     0  IBTE    INTEGER             BSBLK         REFS         8        34
     1  ICBR    INTEGER             MXBLK         REFS        19       188
  2660  ICMP    INTEGER                           REFS       100       101       199       200       259       416       418
                                                   436   DEFINED        94
     0  ID      INTEGER             DOBK          REFS        11
  2673  IDENS   INTEGER                           REFS       146       149       150       151       157       215       218
                                                   219       220       224       284       286       287       288       291
                                               DEFINED       142       146       149       151       211       215       218
                                                   220       280       284       286       288
  2676  IDENT   INTEGER                           REFS       152       157       221       224       289       291
                                               DEFINED       150       152       219       221       287       289
     2  IDF     INTEGER             RODLOD        REFS        22       159       226       293       308
     0  IDR     INTEGER             RODLOD        REFS        22
     2  IDRY    INTEGER             SUBK          REFS        24       390       403
     0  IGINT   INTEGER             MXBLK         REFS        19
  2661  II      INTEGER                           REFS       111       114       115     2*116       118       119     2*120
                                               DEFINED       110       111
  2734  IIL     INTEGER                           REFS       415       416       418       419   DEFINED       415       416
                                                   418       419
  2672  IOH     INTEGER                           REFS       157       159       224       226       291       293
                                               DEFINED       141       200       205       208       262       265       273
                                                   276
  2714  IPBQ    INTEGER                           REFS       314       317   DEFINED       302       310       316
  2652  IQCMP   INTEGER                           REFS        78        81   DEFINED        77        78
  2704  ISB     INTEGER                           REFS       314       317       437   DEFINED       172       173       179
                                                   181
     1  ITY     INTEGER             DOBK          REFS        11
     1  IUBC    INTEGER             SUBK          REFS        24        33       141
     0  IX      INTEGER   ARRAY      F.P.         REFS         2        66        97       112       203       205       261
                                                   262       264       265       268       269       416       418       422
                                                   433   DEFINED         1        65        72        96       457       459
                                                   461       463
  2737  IXBS    INTEGER                           REFS       459   DEFINED       435
  2740  IXCMP   INTEGER                           REFS       461   DEFINED       436
  2741  IXSB    INTEGER                           REFS       463   DEFINED       437
  3036  IXT     INTEGER   ARRAY                   REFS         2       457   DEFINED       433
  2667  IXXC    INTEGER                           REFS       154       165       191       192       194
                                               DEFINED       132       137       165
  3106  IY      INTEGER   ARRAY                   REFS         5        46       102       116       120     2*135       139
                                               DEFINED        33        45       101       115       119       130
  2670  IYSC    INTEGER                           REFS     2*135       137   DEFINED       134
  2674  J       INTEGER                           REFS       144       213     2*244       282       362     2*374       377
                                                 2*386       390       394       402       406   DEFINED       143       212
                                                   243       281       348
  2662  JJ      INTEGER                           REFS       114       115       118       119   DEFINED       112
  2651  JJKM    INTEGER                           REFS      2*72   DEFINED        71
     0  JJMN    INTEGER             GLINK         REFS        12        49        59        60        69        70        72
                                                    75   DEFINED        38        49
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          SUBROUTINE LYR          74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE    11

VARIABLES     SN  TYPE              RELOCATION
     0  JMAN      INTEGER             MANLK         REFS        18        55        69        75        76
  2707  JXMT      INTEGER                           REFS       222       278   DEFINED       196       204       257       263
                                                     274
    26  JXX       INTEGER    ARRAY    MANLK         REFS        18        72
  2726  K         INTEGER                           REFS       353   DEFINED       352
  2703  KK        INTEGER                           REFS       170       176       183       243       251       253       254
                                                     256       258       270       271       272       273       274     2*275
                                                   2*276       371       372       373       390       429       430       447
                                                     448   DEFINED       169       242       252       253       255       256
                                                     268       269       370       371       388       389       428       429
                                                     446       447
  2650  KL        INTEGER                           REFS      2*65      2*66       138       139       332
                                                 DEFINED        64       138       139       332
  2715  KLASS     INTEGER                           REFS       308   DEFINED       304
     0  KX        INTEGER    ARRAY    KEYVAL        REFS        14        65        92
  2725  L         INTEGER                           REFS       348       372       373       374     2*375     2*376       378
                                                     385       386     2*390     2*391     2*392     2*393       395
                                                 DEFINED       347
     1  LFUNC     INTEGER             TYPBK         REFS        27       157       224       291       304       314       317
  2665  LL        INTEGER                           REFS       128       129       130       131       134       138       139
                                                     166       168       169       332       451       453       455       456
                                                 DEFINED       127       128       450       452       454       455
  2733  LLYR      INTEGER                           REFS       415       419   DEFINED       413       414
  2666  LL1       INTEGER                           REFS       133   DEFINED       131
     0  LMH       INTEGER             TYPBK         REFS        27       157       224       291       314       317
     0  LPASS     INTEGER             PASSCK        REFS        21   DEFINED        29        62
    27  LS        INTEGER             LCY           REFS        15        39       189
  2643  LX        INTEGER                           REFS        40       189   DEFINED        39
  2705  LY        INTEGER                           REFS       189   DEFINED       188
     1  LZ        INTEGER             RODLOD        REFS        22       156       223       290       303       373
  2735  M         INTEGER                           REFS       422       425   DEFINED       422       425
  2736  MA        INTEGER                           REFS       424       425   DEFINED       423       424
  2656  ML        INTEGER                           REFS        88        89        90      2*92      2*96      2*97
                                                 DEFINED        87        95
     1  MLYST     INTEGER             MANLK         REFS        18        69   DEFINED        75
  2723  MM        INTEGER                           REFS       344       346       347       362     2*363       364
                                                 DEFINED       343       344
     1  MNTO      INTEGER             SZBK          REFS        25
  2375  MPASS     INTEGER                           REFS        61        62   DEFINED        29        61
     0  MX        INTEGER    ARRAY    CEYVAL        REFS        10        90        94
     0  MXTO      INTEGER             SZBK          REFS        25
   243  NB        INTEGER             LYTD          REFS        16       123
  2730  NCALL     INTEGER                           REFS       379       396       408   DEFINED       377       394       406
  2653  NCLYR     INTEGER                           REFS        80        81        82        83        84        86
    51  NCOM      INTEGER             LYTD          REFS        16        37      2*51        52        79        99       111
                                                     128       198       253       256       269       301       344       371
                                                     389       403       414       424       429       440       443       447
                                                     453       455   DEFINED        53        54       471
  3062  NCST      INTEGER    ARRAY                  REFS         4       377       394       406   DEFINED       259       270
                                                     271       301
  2655  NKLYR     INTEGER                           REFS        89        92       113       271       274       275       276
                                                     388   DEFINED        86       107
  2642  NKOM      INTEGER                           REFS        54        80        81        82       104       105       106
                                                     107       263       264       265       270       417       471
                                                 DEFINED        37
  2657  NL        INTEGER                           REFS        90   DEFINED        88
     0  NLYR      INTEGER              F.P.         REFS        85        87        95       108       109       127       252
     SUBROUTINE LYR        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     12

VARIABLES     SN  TYPE               RELOCATION
                                                         343       370       412       413       414       417       421       423
                                                         428       432       468   DEFINED         1        83        84       104
                                                         105       465
       0  NLYST     INTEGER               NANLK         REFS        20   DEFINED        81       443
       0  NNAT      INTEGER               LYTD          REFS        16        42        43       100       101     2*102       110
                                                         127       195       197       252       255       268       269       271
                                                         348       351       352
    2641  NQBB      INTEGER                             REFS        51        52        57        58        59        60        63
                                                          84       104       105       470   DEFINED        36
    2647  NQLYR     INTEGER                             REFS        58        63        64        71        75        76        83
                                                         105       106       417   DEFINED        59        60        70
     146  NSBB      INTEGER               LYTD          REFS        16        36        56       202       260       301
                                                     DEFINED        50        51        52       470
    3132  NX        INTEGER     ARRAY                   REFS         6        96   DEFINED        90        92
    2654  NXLY      INTEGER                             REFS       416       418       422       446       450       452       454
                                                         465   DEFINED        85       106
       2  NYOO      INTEGER     ARRAY     MANLK         REFS        18        70
       0  SUBD      REAL                  SUBK          REFS        24       140
    2712  TAX       REAL                                REFS       235       236       241   DEFINED       232       234
    2645  TDRY      REAL                                REFS       357       390       403   DEFINED        41       163       357
    2713  TFOB      REAL                                REFS       244       246   DEFINED       241
       0  THFF      REAL        ARRAY     THKBK         REFS        26        40
    2710  THH       REAL                                REFS       235       236       239       241       353       355
                                                     DEFINED       210       349       353
    2717  THIKENS   REAL                                REFS       308       311
    2711  TLIM      REAL                                REFS       224       226       228       229       291       293       295
                                                         296       314       315       317       319       324       326       328
                                                         329       330   DEFINED       311       319
    2721  TLMB      REAL                                REFS       324       326       328   DEFINED       309       315
      12  TM        REAL        ARRAY     HBLK          REFS        13        40       189
    2722  TMLB      REAL                                REFS       324   DEFINED       321       323
       0  TMT       REAL        ARRAY      F.P.         REFS         2       363       364       375       376       378       390
                                                       2*391       392       393       395       403       404       405       407
                                                         415       419       425       431   DEFINED         1       362       363
                                                         374       375       376       386       390       392       393       402
                                                         403       404       405       449
       2  TRYQ      REAL        ARRAY     LCY           REFS        15
    2727  TTT       REAL                                REFS       365       379       396       408   DEFINED       364       378
                                                         395       407
    2706  TX        REAL                                REFS       189       190       192       193       228       235       239
                                                         241       248       295       298     2*319       357       402
                                                     DEFINED       192       229       236       296       329       350       355
    2677  TXX       REAL                                REFS       153       161       232       246       321       333       350
                                                         355   DEFINED       155       162       239       246       328
    2700  TYY       REAL                                REFS       153       157       159       161       162
    2644  TZZ       REAL                                REFS        40        41       153       154       155
                                                     DEFINED       154
     322  WHEELS    REAL        ARRAY     WES           REFS        28
      30  XCBR      REAL                  LCY           REFS        15       173
    2640  XCD       REAL                                REFS       426       466   DEFINED        35       427
       0  XFP       REAL        ARRAY     SGSWP2        REFS        23
     147  XMT       REAL        ARRAY     LYTD          REFS        16       118       119       203       205       261       262
                                                         272       273
    2702  XRR       REAL                                REFS       222       278       279   DEFINED       168
    3012  XTMT      REAL        ARRAY                   REFS         2       449   DEFINED       431
    2701  XXR       REAL                                REFS       178       184       189   DEFINED       167       185
       0  XXT       REAL                   F.P.         REFS        40       189   DEFINED         1
       SUBROUTINE LYR         74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE    13

VARIABLES       SN  TYPE               RELOCATION
     1  YCBR        REAL       ARRAY     LYTD          REFS        16        44        45       207       208       210       353
     1  YKQ         REAL                 LCY           REFS        15
  2742  YMT         REAL       ARRAY                   REFS         2       138       167       168   DEFINED        44       100
                                                        114       118       129
    52  ZCBR        REAL       ARRAY     LYTD          REFS        16       100       101       114       115       199       200
                                                        264       265       275       276
   244  ZMT         REAL       ARRAY     LYTD          REFS        16       124       125       126       129       130

FILE NAMES          MODE
        TAPE5       UNFMT                     WRITES        417       418       419    MOTION       469
        TAPE6       FMT                       WRITES         46        63        66        97       102       116       120       138
                                                 139       153       190       191       193       194       332       333       412
                                                 415       416       420       421       422       425       467       468

EXTERNALS             TYPE    ARGS        REFERENCES
        GINT                   6              40
        GXMT                   2              58
        GZCBR                  2              80
        HINT                   7             189
        MTHICK                 5             308
        RODDENS                4             159       226       293
        SERCST                 3             365       379       396       408
        TLMC                   7             157       224       291
        TLMM                   6             314       317

INLINE FUNCTIONS      TYPE    ARGS           DEF LINE    REFERENCES
        AINT        REAL       1  INTRIN                  363       375       392       404
        FLOAT       REAL       1  INTRIN                  144       213       282
        INT         INTEGER    1  INTRIN                   45       101       115       119       130       200       205       208
                                                          262       265       273       276

STATEMENT LABELS                  DEF LINE    REFERENCES
    70  1                            48           42       444
     0  2                            47           43
     0  3            INACTIVE       441
  2161  4                           445           69        76
     0  5                           439          123
  1516  6                           331          166       249       299
     0  7                           136          133
   521  8                           137          135
   620  9                           159          156
   623  10                          160          158
  1062  11                          226          223
  1065  12                          227          225
  1363  13                          293          290
  1366  14                          294          292
  1443  15                          313          303
  1454  16                          318          312
   672  20                          178          176
   703  21                          182          177       180
     0  22           INACTIVE       179        2*178
   701  23                          181          178
   714  24                          186        2*184
     0  25           INACTIVE       185          184
  1153  26                          250          195
  1027  27                          216          214
     0  29           INACTIVE       215        2*214
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STATEMENT LABELS            DEF LINE  REFERENCES
  1073 30                       230       202       222       228
     0 31          INACTIVE     229     2*228
  1102 32                       234       231
  1115 33                       238       235
     0 34          INACTIVE     236     2*235
  1146 35                       247       237       240
  1124 36                       241       238
  1105 37                       235       233
     0 39                       245       243
  1401 40                       300       251       254
  1307 41                       277       266
  1235 42                       267       258
  1335 43                       285       281       283
     0 44          INACTIVE     284     2*283
  1374 45                       297       260       278       279       295
     0 46          INACTIVE     296     2*295
     0 47          INACTIVE     325       324
  1510 48                       329     2*324       327
   715 52                       187       174       183
  1505 53                       328       325
  1671 55                       385       372       373
  2006 56                       410       346       366       381       398
     0 57                       354       352
  1622 58                       370       361
  1751 59                       402       385
  2145 60                       438       426
     0 61          INACTIVE     427     2*426
  2133 62                       434       430       432
  2243 63                       464       448       458       460       462
  2234 65                       461       453
  2230 66                       459       451
  2240 67                       463       456
     0 68          INACTIVE     343
   437 70                       121       109       117
     0 71                       217       212
   633 72                       164       161
   561 73                       147       145
     0 74          INACTIVE     146     2*145
     0 75                       148       143
   122 81                        59        56        57
   344 83                       103        79        99
   443 84                       122       108
   656 85                       172       170
   665 86                       175       171
  1471 87                       324       322
  1466 88                       323       320
  1573 92                       356       351
     0 100                       67        64
   163 101                       69        55
   207 102                       74        68
     0 103                       73        71
   777 338                      207       197
   763 343                      202       198
  1006 351                      209       201       206
   303 600                       93        87        91
   277 601                       92        89
     0 602                       98        95
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      SUBROUTINE LYR          74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     15

STATEMENT LABELS                 DEF LINE   REFERENCES
  225  603                          78         441
  422  604                         118         113
 2154  605                         442          82       440
 2376  1000     FMT                 30          46        63         66         97        102        116        120        139        191
                                               194       412        421        422        468
 2401  2000     FMT                 31         138       153        190        193        332        333        415        416        420
                                               425
 2405  3000     FMT                 32         467

LOOPS  LABEL      INDEX        FROM-TO      LENGTH     PROPERTIES
   50  2        * I              43 47         17B                 EXT REFS
  146  100      * KL             64 67         13B                 EXT REFS
  176  103        JJKM           71 73         10B         OPT
  264  600        ML             87 93         22B         OPT
  312  602      * ML             95 98         13B                 EXT REFS
  370  70       * I             109 121        52B                 EXT REFS
  445  5        * IBAS          123 439      1503B                 EXT REFS  NOT INNER
  505  7        * I             133 136        13B         OPT       EXITS
  547  75         J             143 148        15B         OPT
  637  6        * I             166 331       662B                 EXT REFS  NOT INNER
 1015  71         J             212 217        15B         OPT
 1134  39         J             243 245         6B     INSTACK
 1323  43         J             281 285        15B         OPT
 1543  56       * I             346 410       246B                 EXT REFS  NOT INNER
 1561  57         K             352 354         6B     INSTACK
 2121  62         I             430 434        15B         OPT
 2171  63         I             448 464        55B         OPT

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       ARBK          1              0 AREA    (1)
       BSBLK         2              0 IBTE    (1)                 1 FDE     (1)
       BSBLK2        1              0 FDEF    (1)
       CEYVAL       20              0 MX      (20)
       DOBK          4              0 ID      (1)                 1 ITY     (1)                 2 OT20    (1)
                                    3 DT      (1)
       GLINK         1              0 JJMN    (1)
       HBLK         30              0 HHQ     (10)               10 TM      (20)
       KEYVAL       20              0 KX      (20)
       LCY          25              0 AXKQ    (1)                 1 YKQ     (1)                 2 TRYQ    (20)
                                   22 FACQ    (1)                23 LS      (1)                24 XCBR    (1)
       LYTD        176              0 NNAT    (1)                 1 YCBR    (40)               41 NCOM    (1)
                                   42 ZCBR    (60)              102 NSBB    (1)               103 XMT     (60)
                                  163 NB      (1)               164 ZMT     (12)
       MANLK       422              0 JMAN    (1)                 1 MLYST   (1)                 2 NYOO    (20)
                                   22 JXX     (400)
       MXBLK         2              0 IGINT   (1)                 1 ICBR    (1)
       NANLK         1              0 NLYST   (1)
       PASSCK        1              0 LPASS   (1)
       PODLOD        3              0 IDR     (1)                 1 LZ      (1)                 2 IDF     (1)
       SGSWP2      200              0 XFP     (200)
       SUBK          3              0 SUBD    (1)                 1 IUBC    (1)                 2 IDRY    (1)
       SZBK          2              0 MXTO    (1)                 1 MNTO    (1)
       THKBK        20              0 THFF    (20)
       TYPBK         2              0 LMH     (1)                 1 LFUNC   (1)
       WES         240              0 ESWL    (200)             200 AESWL   (10)              210 WHEELS  (10)
                                  220 CBR     (20)
      SUBROUTINE LYR         74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE    16

    STATISTICS
      PROGRAM LENGTH                3264B     1716
      CM LABELED COMMON LENGTH      2230B     1176
```

```
SUBROUTINE HINT       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE    1

 1                SUBROUTINE HINT(TX,XXV,XXR,LX,LY,XCV,LS)
                  DIMENSION XCV(20)
                  COMMON /SG5WP2/ XFP(20,10)
                  COMMON/WES/ESWL(10,20),AESWL(10),WHEELS(10),CBR(20)
 5                SLX1=(XFP(LX,LY-1)-XFP(LX-1,LY-1))/(XCV(LX)-XCV(LX-1))
                  SLX2=(XFP(LX,LY)-XFP(LX-1,LY))/(XCV(LX)-XCV(LX-1))
                  SSLX=(SLX2-SLX1)/(CBR(LY)-CBR(LY-1))
                  SLX=SLX1+SSLX*(XXR-CBR(LY-1))
                  SLY1=(XFP(LX-1,LY)-XFP(LX-1,LY-1))/(CBR(LY)-CBR(LY-1))
10                SLY2=(XFP(LX,LY)-XFP(LX,LY-1))/(CBR(LY)-CBR(LY-1))
                  SSLY=(SLY2-SLY1)/(XCV(LX)-XCV(LX-1))
                  SLY=SLY1+SSLY*(XXV-XCV(LX-1))
                  ZX=XFP(LX-1,LY-1)+SLX1*(XXV-XCV(LX-1))
                  ZY=XFP(LX-1,LY-1)+SLY1*(XXR-CBR(LY-1))
15                Z1=ZX+SLY*(XXR-CBR(LY-1))
                  Z2=ZY+SLX*(XXV-XCV(LX-1))
                  TX=(Z1+Z2)/2.
                  RETURN
                  END


    SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
   4  HINT            1           18

VARIABLES      SN  TYPE             RELOCATION
   310  AESWL       REAL       ARRAY    WES          REFS          4
   334  CBR         REAL       ARRAY    WES          REFS          4        2*7        8        2*9       2*10       14       15
     0  ESWL        REAL       ARRAY    WES          REFS          4
     0  LS          INTEGER   *UNUSED    F.P.     DEFINED          1
     0  LX          INTEGER              F.P.        REFS        4*5        4*6      2*9       2*10       2*11       12     2*13
                                                       14         16    DEFINED        1
     0  LY          INTEGER              F.P.        REFS        2*5        2*6      2*7          8        4*9     4*10       13
                                                     2*14         15    DEFINED        1
   145  SLX         REAL                             REFS         16    DEFINED        8
   142  SLX1        REAL                             REFS          7          8       13    DEFINED          5
   143  SLX2        REAL                             REFS          7    DEFINED        6
   151  SLY         REAL                             REFS         15    DEFINED       12
   146  SLY1        REAL                             REFS         11         12       14    DEFINED          9
   147  SLY2        REAL                             REFS         11    DEFINED       10
   144  SSLX        REAL                             REFS          8    DEFINED        7
   150  SSLY        REAL                             REFS         12    DEFINED       11
     0  TX          REAL                 F.P.     DEFINED          1         17
   322  WHEELS      REAL       ARRAY    WES          REFS          4
     0  XCV         REAL       ARRAY    F.P.         REFS          2        2*5      2*6       2*11         12       13       16
                                                  DEFINED          1
     0  XFP         REAL       ARRAY    SG5WP2       REFS          3        2*5      2*6        2*9       2*10       13       14
     0  XXR         REAL                 F.P.        REFS          8         14       15    DEFINED          1
     0  XXV         REAL                 F.P.        REFS         12         13       16    DEFINED          1
   152  ZX          REAL                             REFS         15    DEFINED       13
   153  ZY          REAL                             REFS         16    DEFINED       14
   154  Z1          REAL                             REFS         17    DEFINED       15
   155  Z2          REAL                             REFS         17    DEFINED       16
```

```
      SUBROUTINE HINT         74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00       PAGE     2

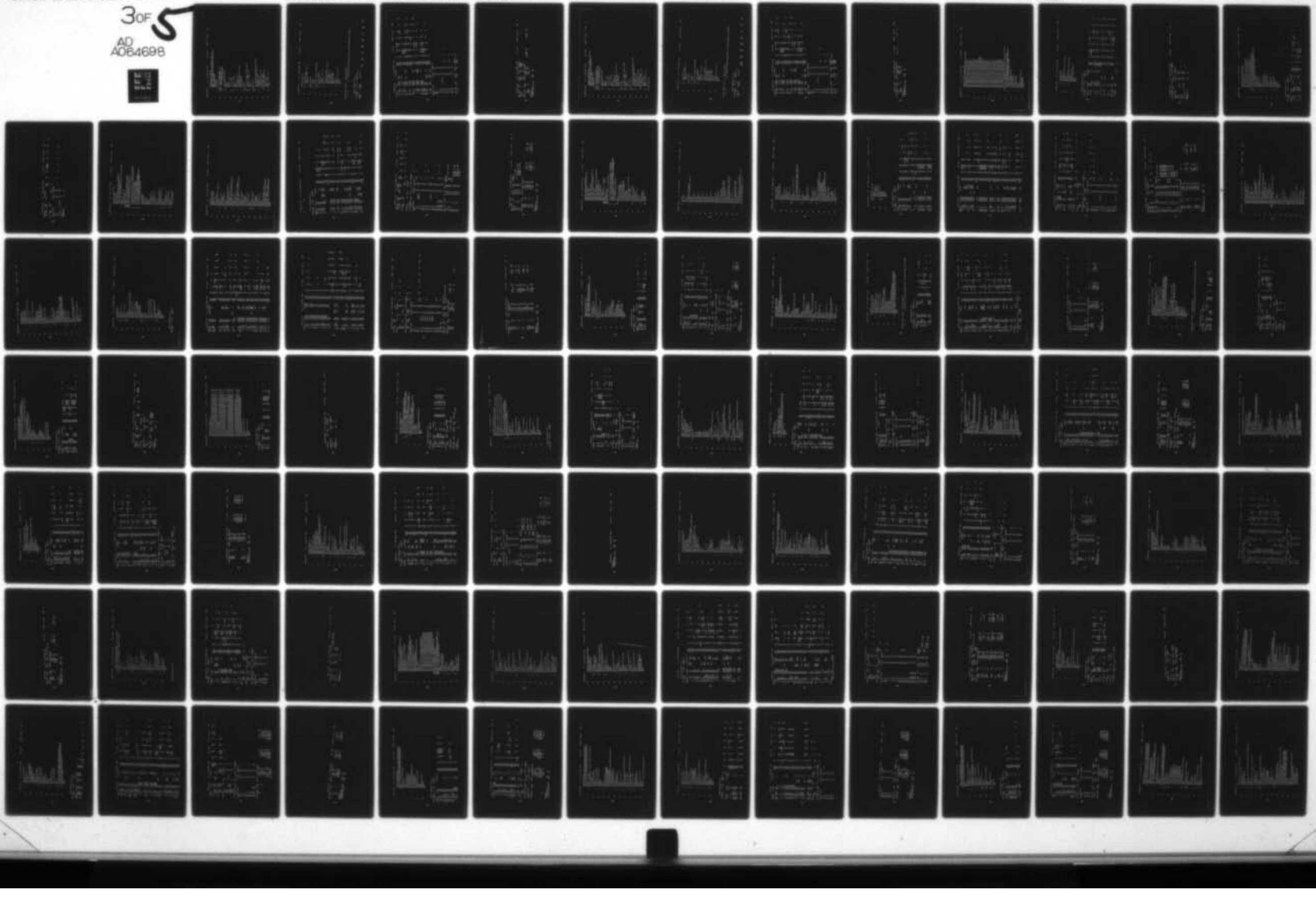
COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
      SGSWP2       200                  0 XFP      (200)
      WES          240                  0 ESWL     (200)             200 AESWL  (10)             210 WHEELS (10)
                                      220 CBR      (20)

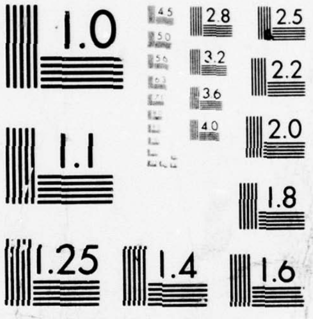
STATISTICS
  PROGRAM LENGTH                 1568B      110
  CM LABELED COMMON LENGTH       670B       440
```

AD-A064 698 CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAI--ETC F/G 13/2
SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS. VOLUME III.--ETC(U)
JAN 79 E S LINDOW
UNCLASSIFIED CERL-TR-M-253-VOL-3 NL

3 OF 5

AD
A064698





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
SUBROUTINE GXMT        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00         PAGE    1

                SUBROUTINE GXMT (NSBB,NLYR)
                DIMENSION IPOINT (20), IMAX (20), IROW (20) , XMTK (20)
                COMMON /LYTD/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSQQ,XMT(10,6)
                COMMON /KEYVAL/ IX(20)
                COMMON /PASSBK/ NPASS
                INTEGER ORG
                DATA NPASS/1/
          C
          C NSBB = TOTAL NUMBER OF LAYERS
          C IX   = ARRAY OF RETURN POSIBILITIES
          C NLYR = NUMBER OF VALUES IN IX
          C        = 0 IF SCHEMES ARE EXHAUSTED
          C
                GO TO (134,135,62), NPASS
          135   IPOINT (1) = 1
                LPTR = 1
                NLYR = 1
                NPASS=3
                IMAX (1) = NSBB
          C
          C     TRANSFER VALUES
          C
          41    ASSIGN 41 TO NSWTH
                ORG = 1
                OTEMP = 0
          10    DO 5 I = ORG, NLYR
                KK = IPOINT (I)
                IF (OTEMP .EQ. XMTK (KK)) GO TO 30
                OTEMP = XMTK (KK)
          5     IX (I) =IROW (KK)
                RETURN
          C
          C JUMP ROUTINE
          C
          30    IF (NLYR-I +IPOINT(I )-NSBB) 32,62,62
          32    DO 35 J = I , NLYR
          35    IPOINT (J)  = IPOINT (J)  + 1
                ORG = I
                GO TO 10
          C
          C INCREMENT LEVELS
          C
          62    IF (IPOINT (LPTR) .EQ. IMAX (LPTR)) GO TO 50
                IPOINT (LPTR) = IPOINT (LPTR) + 1
                GO TO NSWTH, (41,45)
          50    LPTR =LPTR-1
                ASSIGN 45 TO NSWTH
                IF (LPTR .GT. 0 ) GO TO 62
```

```
SUBROUTINE GXMT        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE     2

                 C RESET LOWER LEVELS
                 C
    60           45     KK = LPTR +1
                        DO 47  J = KK,NLYR
                 47     IPOINT (J) = IPOINT (J-1) + 1
                        LPTR = NLYR
                        GO TO 41
    65           C
                 C END OF ROUTINE
                 C
                 64     NLYR = 0
                        RETURN
    70           C
                 C SORT ROUTINE USED ONLY ON FIRST PASS
                 C
                 134    DO 11 J = 1,NSBB
                        XMTK(J) = XMT(J,1)
    75           11     IROW(J) = J
                        N = NSBB
                 4      IF(N .EQ. 1) GO TO 135
                        ISWIT = 0
                        I = 1
    80           3      IF(I .EQ. N) GO TO 1
                        IF(XMTK(I) .LE. XMTK(I+1)) GO TO 2
                        TEMP = XMTK(I)
                        XMTK(I) = XMTK(I + 1)
                        XMTK(I+1) = TEMP
    85                  ITMP = IROW(I)
                        IROW(I) = IROW(I+1)
                        IROW(I+1) = ITMP
                        ISWIT = 1
                 2      I = I+1
    90                  GO TO 3
                 1      IF(ISWIT .EQ. 0) GO TO 135
                        N = N-1
                        GO TO 4
                        END


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

    14     I                AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.


        SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
    4  GXMT            1           31          69

 VARIABLES       SN  TYPE              RELOCATION
   263  I            INTEGER                              REFS         27          30          2*35         36          38          80          2*81
                                                                82          2*83        84          85           2*86        87          89
```

```
     SUBROUTINE GXMT        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00       PAGE      3

VARIABLES     SN  TYPE            RELOCATION
                                          DEFINED      26      79      89
 316 IMAX    INTEGER  ARRAY                  REFS       2      43 DEFINED      19      55
 272 IPOINT  INTEGER  ARRAY                  REFS       2      27      35      37      43      44      62
                                          DEFINED      15      37      44      54      62
 342 IROW    INTEGER  ARRAY                  REFS       2      30      85      86 DEFINED      75      86
                                               87
 267 ISWIT   INTEGER                         REFS      91 DEFINED      78      88
 271 ITMP    INTEGER                         REFS      87 DEFINED      85
   0 IX      INTEGER  ARRAY  KEYVAL          REFS       4 DEFINED      30
 265 J       INTEGER                         REFS    2*37    2*54    2*55    2*62    2*74    2*75
                                          DEFINED      36      53      61      73
 264 KK      INTEGER                         REFS      28      29      30      61 DEFINED      27      60
 260 LPTR    INTEGER                         REFS    2*43    2*44      46      48      60
                                          DEFINED      16      46      52      63
 266 N       INTEGER                         REFS      77      80      92 DEFINED      76      92
  51 NCOM    INTEGER         LYTD            REFS       3
   0 NLYR    INTEGER          F.P.           REFS      26      35      36      49      51      52      53
                                               55      61      63 DEFINED       1      17      49      68
   0 NNAT    INTEGER         LYTD            REFS       3
   0 NPASS   INTEGER         PASSBK          REFS       5      14 DEFINED       7      18
   0 NSBB    INTEGER          F.P.           REFS      19      35      51      55      73      76
                                          DEFINED       1
 146 NSQO    INTEGER         LYTD            REFS       3
 261 NSWTH   INTEGER                         REFS      45 DEFINED      23      47
 257 ORG     INTEGER                         REFS       6      26 DEFINED      24      38
 262 OTEMP   REAL                            REFS      28 DEFINED      25      29
 270 TEMP    REAL                            REFS      84 DEFINED      82
 147 XMT     REAL     ARRAY  LYTD            REFS       3      74
 366 XMTK    REAL     ARRAY                  REFS       2      28      29    2*81      82      83
                                          DEFINED      74      83      84

   1 YCBR    REAL     ARRAY  LYTD            REFS       3
  52 ZCBR    REAL     ARRAY  LYTD            REFS       3

STATEMENT LABELS       DEF LINE  REFERENCES
 253 1                    91      80
 247 2                    89      81
 215 3                    80      90
 206 4                    77      93
   0 5                    30      26
  47 10                   26      39
   0 11                   75      73
  71 30                   35      28
   0 32      INACTIVE     36      35
   0 35                   37      36
  41 41                   23      23      45      56      64
 152 45                   60      45      47
   0 47                   62      61
 121 50                   46      43
   0 52                   55      53
 110 62                   43      14    2*35      48
 167 64                   68      51
 172 134                  73      14
  27 135                  15      14      77      91

LOOPS  LABEL   INDEX      FROM-TO    LENGTH   PROPERTIES
  51   5     * I          26 30      168        OPT     EXITS
  77   35      J          36 37       58      INSTACK
```

```
      SUBROUTINE GXMT        74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00         PAGE      4

LOOPS  LABEL    INDEX      FROM-TO      LENGTH     PROPERTIES
  141  52       J           53 55          7B       INSTACK
  156  47       J           61 62          5B       INSTACK
  173  11       J           73 75         10B          OPT

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       LYTD        163                 0 NNAT     (1)                   1 YCBR    (40)                 41 NCOM     (1)
                                      42 ZCBR     (60)                102 NSQQ    (1)                 103 XMT      (60)
       KEYVAL       20                 0 IX       (20)
       PASSBK        1                 0 NPASS    (1)

STATISTICS
  PROGRAM LENGTH                   422B      274
  CM LABELED COMMON LENGTH         270B      184
```

```
SUBROUTINE GZCBR       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE     1

            SUBROUTINE GZCBR(NSBB,NLYR)
            DIMENSION IPOINT (20), IMAX (20), IROW (20) , XMTK (20)
            COMMON /LYTD/ NNAT,YCBR(10,4),NCQQ,ZCBR(10,6)
            COMMON /CEYVAL/ IX(20)
            COMMON /PASSCK/ NPASS
            INTEGER ORG
      C
      C NSBB = TOTAL NUMBER OF LAYERS
      C IX   = ARRAY OF RETURN POSIBILITIES
      C NLYR = NUMBER OF VALUES IN IX
      C        = 0 IF SCHEMES ARE EXHAUSTED
      C
            GO TO (134,135,62), NPASS
      135   IPOINT (1) = 1
            LPTR = 1
            NLYR = 1
            NPASS=3
            IMAX (1) = NSBB
      C
      C     TRANSFER VALUES
      C
      41    ASSIGN 41 TO NSWTH
            ORG = 1
            OTEMP = 0
      10    DO 5 I = ORG, NLYR
            KK = IPOINT (I)
            IF (OTEMP .EQ. XMTK (KK)) GO TO 30
            OTEMP = XMTK (KK)
      5     IX (I) =IROW (KK)
            RETURN
      C
      C JUMP ROUTINE
      C
      30    IF (NLYR-I +IPOINT(I )-NSBB) 32,62,62
      32    DO 35 J = I , NLYR
      35    IPOINT (J)  = IPOINT (J)  + 1
            ORG = I
            GO TO 10
      C
      C INCREMENT LEVELS
      C
      62    IF (IPOINT (LPTR) .EQ. IMAX (LPTR)) GO TO 50
            IPOINT (LPTR) = IPOINT (LPTR) + 1
            GO TO NSWTH, (41,45)
      50    LPTR =LPTR-1
            ASSIGN 45 TO NSWTH
            IF (LPTR .GT. 0 ) GO TO 62
            NLYR = NLYR +1
      C CHECK FOR END OF SCHEMES
            IF (NLYR .GT. NSBB) GO TO 64
            LPTR = NLYR
            DO 52 J = 1,NLYR
            IPOINT (J) = J
      52    IMAX (J) = NSBB - NLYR + J
            GO TO 41
      C
      C RESET LOWER LEVELS
```

```
SUBROUTINE GZCBR      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     2
                C
                45     KK = LPTR +1
      60               DO 47  J = KK,NLYR
                47     IPOINT (J) = IPOINT (J-1) + 1
                       LPTR = NLYR
                       GO TO 41
                C
      65        C END OF ROUTINE
                C
                64     NLYR = 0
                       RETURN
                C
      70        C SORT ROUTINE USED ONLY ON FIRST PASS
                C
                134    DO 11 J = 1,NSBB
                       XMTK(J)=ZCBR(J,1)
                11     IROW(J) = J
      75               N = NSBB
                4      IF(N .EQ. 1) GO TO 135
                       ISWIT = 0
                       I = 1
                3      IF(I .EQ. N) GO TO 1
      80               IF(XMTK(I) .LE. XMTK(I+1)) GO TO 2
                       TEMP = XMTK(I)
                       XMTK(I) = XMTK(I + 1)
                       XMTK(I+1) = TEMP
                       ITMP = IROW(I)
      85               IROW(I) = IROW(I+1)
                       IROW(I+1) = ITMP
                       ISWIT = 1
                2      I = I+1
                       GO TO 3
      90        1      IF(ISWIT .EQ. 0) GO TO 135
                       N = N-1
                       GO TO 4
                       END


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

    13    I                   AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
   4  GZCBR           1           30        68

VARIABLES       SN  TYPE              RELOCATION
  263  I            INTEGER
                                                     REFS         26        29       2*34       35        37        79       2*80
                                                       81       2*82        83         84     2*85        86        88
                                                   DEFINED        25        78         88
       SUBROUTINE G7CBR     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE      3

VARIABLES     SN  TYPE            RELOCATION
  316  IMAX      INTEGER    ARRAY                   REFS         2        42   DEFINED        18        54
  272  IPOINT    INTEGER    ARRAY                   REFS         2        26        34        36        42        43        61
                                                 DEFINED        14        36        43        53        61
  342  IROW      INTEGER    ARRAY                   REFS         2        29        84        85   DEFINED        74        85
                                                      86
  267  ISWIT     INTEGER                            REFS        90   DEFINED        77        87
  271  ITMP      INTEGER                            REFS        86   DEFINED        84
    0  IX        INTEGER    ARRAY   CEYVAL          REFS         4   DEFINED        29
  265  J         INTEGER                            REFS      2*36      2*53      2*54      2*61      2*73      2*74
                                                 DEFINED        35        52        60        72
  264  KK        INTEGER                            REFS        27        28        29        60   DEFINED        26        59
  260  LPTR      INTEGER                            REFS      2*42      2*43        45        47        59
                                                 DEFINED        15        45        51        62
  266  N         INTEGER                            REFS        76        79        91   DEFINED        75        91
   51  NCQQ      INTEGER            LYTD            REFS         3
    0  NLYR      INTEGER             F.P.           REFS        25        34        35        48        50        51        52
                                                      54        60        62   DEFINED         1        16        48        67
    0  NNAT      INTEGER            LYTD            REFS         3
    0  NPASS     INTEGER            PASSCK          REFS         5        13   DEFINED        17
    0  NSBB      INTEGER             F.P.           REFS        18        34        50        54        72        75
                                                 DEFINED         1
  261  NSWTH     INTEGER                            REFS        44   DEFINED        22        46
  257  OPG       INTEGER                            REFS         6        25   DEFINED        23        37
  262  OTEMP     REAL                               REFS        27   DEFINED        24        28
  270  TEMP      REAL                               REFS        83   DEFINED        81
  366  XMTK      REAL       ARRAY                   REFS         2        27        28      2*80        81        82
                                                 DEFINED        73        82        83
    1  YCBR      REAL       ARRAY   LYTD            REFS         3
   52  7CBR      REAL       ARRAY   LYTD            REFS         3        73

STATEMENT LABELS            DEF LINE   REFERENCES
  253  1                         90        79
  247  2                         88        80
  215  3                         79        89
  206  4                         76        92
    0  5                         29        25
   47  10                        25        38
    0  11                        74        72
   71  30                        34        27
    0  32          INACTIVE      35        34
    0  35                        36        35
   41  41                        22        22        44        55        63
  152  45                        59        44        46
    0  47                        61        60
  121  50                        45        42
    0  52                        54        52
  110  62                        42        13      2*34        47
  167  64                        67        50
  172  134                       72        13
   27  135                       14        13        76        90

LOOPS  LABEL    INDEX    FROM-TO    LENGTH    PROPERTIES
   51  5       * I        25 29        168       OPT      EXITS
   77  35        J        35 36         58     INSTACK
  141  52        J        52 54         78     INSTACK
  156  47        J        60 61         58     INSTACK
  173  11        J        72 74        108       OPT
```

```
      SUBROUTINE GZCBR      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     4

 COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       LYTD         102              0 NNAT    (1)               1 YCBR   (40)              41 NCQQ    (1)
                                    42 ZCBR    (60)
       CEYVAL        20              0 IX      (20)
       PASSCK         1              0 NPASS   (1)

 STATISTICS
   PROGRAM LENGTH                  422B       274
   CM LABELED COMMON LENGTH        173B       123
```

```
      SUBROUTINE TLMC(IA,IB,IC,ID,IE,A,B)
      DIMENSION TCOMP(6,6,5),TCOMC(6,6,5),TYPBS(6,5),TYPBC(6,5)
      DATA (TCOMP(1,I,1),I=1,4) /100.,1.5,1.,100./
      DATA (TCOMP(2,I,1),I=1,4) /3.,2.5,2.,100./
      DATA (TCOMP(3,I,1),I=1,4) /4.5,4.,3.5,2./
      DATA (TCOMP(1,I,2),I=1,4) /100.,2.5,2.,100./
      DATA (TCOMP(2,I,2),I=1,4) /5.,4.5,3.5,100./
      DATA (TCOMP(3,I,2),I=1,4) /8.,7.5,6.5,4./
      DATA (TCOMP(1,I,3),I=1,4) /100.,3.5,3.,100./
      DATA (TCOMP(2,I,3),I=1,4) /7.,6.5,5.5,100./
      DATA (TCOMP(3,I,3),I=1,4) /11.5,10.5,9.,5.5/
      DATA (TCOMP(1,I,4),I=1,4) /100.,4.,3.5,100./
      DATA (TCOMP(2,I,4),I=1,4) /9.5,8.5,7.,100./
      DATA (TCOMP(3,I,4),I=1,4) /14.,13.,11.,6.5/
      DATA (TCOMP(1,I,5),I=1,4) /100.,100.,100.,100./
      DATA (TCOMP(2,I,5),I=1,4) /100.,100.,100.,100./
      DATA (TCOMP(3,I,5),I=1,4) /100.,100.,100.,100./
      DATA (TCOMC(1,I,1),I=1,4) /100.,1.,1.,100./
      DATA (TCOMC(2,I,1),I=1,4) /2.,1.5,1.5,100./
      DATA (TCOMC(3,I,1),I=1,4) /2.5,2.5,2.,1.5/
      DATA (TCOMC(1,I,2),I=1,4) /100.,1.5,1.5,100./
      DATA (TCOMC(2,I,2),I=1,4) /3.,2.5,2.,100./
      DATA (TCOMC(3,I,2),I=1,4) /4.5,4.,3.5,2./
      DATA (TCOMC(1,I,3),I=1,4) /100.,2.,1.5,100./
      DATA (TCOMC(2,I,3),I=1,4) /4.,3.5,3.,100./
      DATA (TCOMC(3,I,3),I=1,4) /6.5,6.,5.,3./
      DATA (TCOMC(1,I,4),I=1,4) /100.,2.5,2.,100./
      DATA (TCOMC(2,I,4),I=1,4) /5.5,5.,4.,100./
      DATA (TCOMC(3,I,4),I=1,4) /8.5,8.,6.5,4./
      DATA (TCOMC(1,I,5),I=1,4) /100.,3.,2.5,100./
      DATA (TCOMC(2,I,5),I=1,4) /6.5,6.,5.5,100./
      DATA (TCOMC(3,I,5),I=1,4) /10.5,9.5,8.,4.5/
      DATA (TYPBS(1,I),I=1,5) /1.5,2.,3.,3.5,100./
      DATA (TYPBS(2,I),I=1,5) /2.5,4.,5.5,7.5,100./
      DATA (TYPBS(3,I),I=1,5) /3.,5.5,8.,10.,100./
      DATA (TYPBC(1,I),I=1,5) /1.,1.5,1.5,2.,2.5/
      DATA (TYPBC(2,I),I=1,5) /1.5,2.5,3.,4.5,5./
      DATA (TYPBC(3,I),I=1,5) /1.5,3.,4.,5.5,7./
 1000 FORMAT(//"  INADMISSIBLE CASE-TLMC(DENSITY CHARTS)-IA,IB,IC,ID,IE,
     1A,TLU,TLL",5(I4),3(F5.1))
C     THE INFORMATION USED BY SUBROUTINE TLMC IS TAKEN FROM
C     AIRFIELD FLEXIBLE PAVEMENTS-AIRFORCE, TM 5-824-2 (DEPARTMENT OF
C     THE ARMY, 7 FEBRUARY 1969), CHAPTER 2, TABLE I.
      IF(IA.GT.3) GO TO 1
      IF(IC.EQ.2.OR.IC.EQ.4)GO TO 2
      TLU=TCOMP(IA,IB,ID)
      TLL=TCOMP(IA,IB,IE)
      GO TO 5
    2 TLU=TCOMC(IA,IB,ID)
      TLL=TCOMC(IA,IB,IE)
      GO TO 5
    1 CONTINUE
      IA=IA-3
      IF(IC.EQ.2.OR.IC.EQ.4)GO TO 3
      TLU=TYPBS(IA,ID)
      TLL=TYPBS(IA,IE)
      GO TO 5
```

```
       SUBROUTINE TLMC       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00        PAGE       2

                   3   TLU=TYPHC(IA,ID)
                       TLL=TYPBC(IA,IE)
      60           5   CONTINUE
                       IF(TLU-90.) 6,4,4
                   4   WRITE(8,1000)  IA,IB,IC,ID,IE,A,TLU,TLL
                       STOP 3061
                   6   CONTINUE
      65               IF(TLL-90.) 7,8,8
                   8   WRITE(8,1000)  IA,IB,IC,ID,IE,A,TLU,TLL
                       STOP 3062
                   7   CONTINUE
                       DSL=105.-5.*FLOAT(ID)
      70               B=TLU-((A-DSL)/5.)*(TLU-TLL)
                       B=B*12.
                       RETURN
                       END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    4 TLMC              1       72

VARIABLES     SN TYPE            RELOCATION
     0 A         REAL                 F.P.        REFS        62        66        70   DEFINED         1
     0 B         REAL                 F.P.        REFS        71   DEFINED         1        70        71
   217 DSL       REAL                             REFS        70   DEFINED        69
     0 IA        INTEGER              F.P.        REFS        44        46        47        49        50        53        55
                                                    56        58        59        62        66   DEFINED         1        53
     0 IB        INTEGER              F.P.        REFS        46        47        49        50        62        66
                                               DEFINED         1
     0 IC        INTEGER              F.P.        REFS      2*45      2*54        62        66   DEFINED         1
     0 ID        INTEGER              F.P.        REFS        46        49        55        58        62        66        69
                                               DEFINED         1
     0 IE        INTEGER              F.P.        REFS        47        50        56        59        62        66
                                               DEFINED         1
   504 TCOMC     REAL       ARRAY                 REFS         2        49        50   DEFINED        18        19        20
                                                    21        22        23        24        25        26        27        28
                                                    29        30        31        32
   220 TCOMP     REAL       ARRAY                 REFS         2        46        47   DEFINED         3         4         5
                                                     6         7         8         9        10        11        12        13
                                                    14        15        16        17
   216 TLL       REAL                             REFS        62        65        66        70   DEFINED        47        50
                                                    56        59
   215 TLU       REAL                             REFS        61        62        66      2*70   DEFINED        46        49
                                                    55        58
  1026 TYPBC     REAL       ARRAY                 REFS         2        58        59   DEFINED        36        37        38
   770 TYPBS     REAL       ARRAY                 REFS         2        55        56   DEFINED        33        34        35

FILE NAMES        MODE
       TAPE8     FMT                   WRITES       62        66
      SUBROUTINE TLMC       74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420       09/02/77  13.54.00       PAGE     3

INLINE FUNCTIONS    TYPE    ARGS        DEF LINE  REFERENCES
      FLOAT      REAL        1  INTRIN              69

STATEMENT LABELS               DEF LINE   REFERENCES
   55  1                          52        44
   36  2                          49        45
  100  3                          58        54
    0  4            INACTIVE      62        2*61
  112  5                          60        48         51         57
  122  6                          64        61
  132  7                          68        65
    0  8            INACTIVE      66        2*65
  150  1000    FMT                39        62         66

STATISTICS
  PROGRAM LENGTH                10708     568
```

```
      SUBROUTINE TLMM        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00          PAGE      1

 1                      SUBROUTINE TLMM(IA.IB.IC.IE,ID.B)
                        DIMENSION PMT1(3.6),PMT2(3.6),BMT(3)
                        DATA BMT /10.,9.,9./
                        DATA (PMT1(1.I),I=1.6) /100.,3.,3.,100.,3.,2./
 5                      DATA (PMT1(2.I),I=1.6) /4.,3.,3.,100.,3.,2./
                        DATA (PMT1(3.I),I=1.6) /5.,4.,4.,3.,3.,2./
                        DATA (PMT2(1,I),I=1.6) /100.,4.,3.,100.,4.,2./
                        DATA (PMT2(2.I),I=1,6) /5.,4.,4.,100.,3.,2./
                        DATA (PMT2(3.I),I=1.6) /6.,5.,5.,3.,3.,2./
10                 1000 FORMAT(/" INADMISSIBLE CASE - TLMM(THICKNESS CHARTS) ")
                  C     THE INFORMATION USED BY SUBROUTINE TLMM IS TAKEN FROM
                  C     AIRFIELD FLEXIBLE PAVEMENTS-AIRFORCE, TM 5-824-2 (DEPARTMENT OF
                  C     THE ARMY, 7 FEBRUARY 1969), CHAPTER 2, TABLE II.
                        IF(ID.EQ.2) GO TO 1
15                      IF(IC.EQ.2) GO TO 2
                        TLIM=PMT1(IA,IB)
                        GO TO 5
                      2 TLIM=PMT2(IA,IB)
                        GO TO 5
20                    1 TLIM=6.
                        IF(IA.GT.3) GO TO 5
                        IF(IA.LT.3) GO TO 5
                        IF(IB.GT.3) GO TO 5
                        IF(IC.EQ.2) GO TO 3
25                      IF(IE.EQ.2) GO TO 5
                        TLIM=BMT(IB)
                        GO TO 5
                      3 IF(IE.EQ.2) GO TO 5
                        TLIM=BMT(IB)-1.
30                    5 CONTINUE
                        IF(TLIM-90.) 8,9,9
                      9 WRITE(8,1000)
                        STOP 3071
                      8 CONTINUE
35                      B=TLIM
                        RETURN
                        END


            SYMBOLIC REFERENCE MAP (R=3)

      ENTRY POINTS      DEF LINE      REFERENCES
          4  TLMM           1            36

      VARIABLES       SN  TYPE              RELOCATION
          0  B            REAL                    F.P.       DEFINED        1          35
        163  BMT          REAL         ARRAY                    REFS        2          26          29     DEFINED           3
          0  IA           INTEGER                 F.P.          REFS       16          18          21          22     DEFINED          1
          0  IB           INTEGER                 F.P.          REFS       16          18          23          26          29
                                                             DEFINED        1
          0  IC           INTEGER                 F.P.          REFS       15          24     DEFINED           1
          0  ID           INTEGER                 F.P.          REFS       14     DEFINED           1
          0  IE           INTEGER                 F.P.          REFS       25          28     DEFINED           1
        117  PMT1         REAL         ARRAY                    REFS        2          16     DEFINED           4           5          6
```

```
       SUBROUTINE TLMM       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      2

VARIABLES     SN  TYPE           RELOCATION
  141  PMT2      REAL       ARRAY                  REFS         2         18    DEFINED        7         8         9
  116  TLIM      REAL                              REFS        31         35    DEFINED       16        18        20        26
                                                     29

FILE NAMES        MODE
       TAPE8     FMT                     WRITES      32

STATEMENT LABELS            DEF LINE   REFERENCES
   31  1                       20        14
   23  2                       18        15
   57  3                       28        24
   66  5                       30        17        19        21        22        23        25        27        28
   76  8                       34        31
    0  9              INACTIVE 32       2*31
  101  1000    FMT             10        32

STATISTICS
  PROGRAM LENGTH               1708     120
```

```
      SUBROUTINE XMSTR(XXT.CST.CSF)
      DIMENSION STRT(10)
      COMMON /AMBLK/ MXN
      COMMON /DOBK/ ID
      COMMON /FLSVK/ NXSTRT(2).XSTRT(2.10).XTMO(2.10.4)
      COMMON /RDSTR/ IMAN,NUMS.NOO(10).CSTRT(10.6)
      COMMON /RESTR/ IREST.JRESTO.ICOUNT
      COMMON /RLSVK/ RSTRT(10).FSTRT(10).RTMO(10.4).FTMO(10.4).NRSTRT.
     1NFSTRT
      COMMON /SCAN3/ JDL
      COMMON /S7BK/ MXTO.MNTO
 1000 FORMAT(2X.6F10.2)
 2000 FORMAT(2X." XMSTR- COST OF STRATEGY IS ".F14.2)
 3000 FORMAT(2X." XMSTR-RIGID STRATEGY ".6(2X.F6.0))
 4000 FORMAT(" XMSTR-CONSEQUENCES ".4(5X.F6.0))
 5000 FORMAT(" XMSTR-FLEXIBLE STRATEGY ".6(2X.F6.0))
C
C     THIS SUBROUTINE EITHER SETS UP READ-IN STRATEGIES OR GENERATES
C     STRATEGIES FOR INPUT INTO CONSEQ.  IT SAVES THE CHEAPEST
C     MAINTENANCE STRATEGY FOR EACH DESIGN.
C     STRT CONTAINS THE YEARS OF OVERLAYS.
C     NSTRT CONTAINS THE NUMBER OF OVERLAYS.
C     TMO CONTAINS THE TYPE AND THICKNESS OF OVERLAYS.
C     CST IS THE TOTAL OF CONSTRUCTION. DISCOUNTED MAINTENANNCE.
C     AND DISCOUNTED USER COSTS.FOR THE BEST STRATEGY
C     XXT IS LIFE OF ORIGINAL CONSTRUCTION.
C
      CST=10000000000.
      CSF=10000000000.
      NSTRT=1
      DO 4 I=1.10
      STRT(I)=0.
    4 CONTINUE
      MM=MNTO
      MN=MXTO
      IF(IMAN.EQ.2) MM=MN
      DO 1 J=MM.MN
      IF(IMAN.EQ.2) GO TO 11
      DO 2 I=1.MXN
      IF(I.GT.1) GO TO 10
      STRT(1)=XXT
      GO TO 9
   10 CONTINUE
      STRT(I)=FLOAT(J)+STRT(I-1)
    9 CHK=STRT(I)+FLOAT(J)
      IF(CHK-FLOAT(JDL)+.1) 6.2.2
    6 NSTRT=I
    2 CONTINUE
      GO TO 12
   11 NUMO=NOO(ICOUNT)
      IF(NUMO.EQ.0) GO TO 14
      DO 13 I=1.NUMO
      STRT(I)=CSTRT(ICOUNT.I)
   13 CONTINUE
   14 NSTRT=NUMO
      STRT(1)= CSTRT(ICOUNT.1)
      IF(ID.NE.1) GO TO 12
```

```
          STRT(1)=XXT
          IF(XXT.LT.1.) STRT(1)=1.
          IF(NSTRT.EQ.0) NSTRT=1
          IF(NSTRT.EQ.1) GO TO 12
          LBAD=0
          DO 20 I=1,NSTRT
          IF(I.EQ.1) GO TO 20
          IF(STRT(I).GT.STRT(1)+1.) GO TO 20
          LBAD=LBAD+1
   20     CONTINUE
          IF(LBAD.EQ.0) GO TO 12
          MSTRT=NSTRT-LBAD
          DO 21 I=2,MSTRT
          STRT(I)=STRT(I+LBAD)
   21     CONTINUE
   12     CONTINUE
          CALL CONSEQ(STRT,NSTRT,CSMN,CFMN)
          IF(IREST.EQ.3) GO TO 50
          NSTRT1=NXSTRT(1)
          WRITE(6,3000) (XSTRT(1,I),I=1,NSTRT1)
          WRITE(6,4000) ((XTMO(1,I,K),K=1,4),I=1,NSTRT1)
          WRITE(6,2000) CSMN
   50     CONTINUE
          IF(IREST.EQ.2) GO TO 51
          NSTRT2=NXSTRT(2)
          WRITE(6,5000) (XSTRT(2,I),I=1,NSTRT2)
          WRITE(6,4000) ((XTMO(2,I,K),K=1,4),I=1,NSTRT2)
          WRITE(6,2000) CFMN
   51     CONTINUE
          IF(IREST.EQ.3) GO TO 52
          IF(CST-CSMN) 40,5,5
    5     CST=CSMN
          NRSTRT=NXSTRT(1)
          DO 8 I=1,NRSTRT
          RSTRT(I)=XSTRT(1,I)
          DO 8 K=1,4
          RTMO(I,K)=XTMO(1,I,K)
    8     CONTINUE
   40     CONTINUE
   52     IF(IREST.EQ.2) GO TO 1
          IF(CSF-CFMN) 1,42,42
   42     CSF=CFMN
          NFSTRT=NXSTRT(2)
          DO 43 I=1,NFSTRT
          FSTRT(I)=XSTRT(2,I)
          DO 43 K=1,4
          FTMO(I,K)=XTMO(2,I,K)
   43     CONTINUE
    1     CONTINUE
          IF(IREST.EQ.2) GO TO 53
          WRITE(6,1000) (FSTRT(I),I=1,NFSTRT)
          WRITE(6,1000) ((FTMO(I,J),J=1,4),I=1,NFSTRT)
   53     IF(IREST.EQ.3) GO TO 54
          WRITE(6,1000) (RSTRT(I),I=1,NRSTRT)
          WRITE(6,1000) ((RTMO(I,J),J=1,4),I=1,NRSTRT)
   54     CONTINUE
          RETURN
```

```
      SUBROUTINE XMSTR      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE     3

  115              END



      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE  .  REFERENCES
     4  XMSTR           1         114

 VARIABLES      SN  TYPE            RELOCATION
   652  CFMN        REAL                            REFS        74         85        98        99
   645  CHK         REAL                            REFS        46    DEFINED        45
     0  CSF         REAL                  F.P.      REFS        98    DEFINED         1        29        99
   651  CSMN        REAL                            REFS        74         79        88        89
     0  CST         REAL                  F.P.      REFS        88    DEFINED         1        28        89
    14  CSTRT       REAL        ARRAY     RDSTR     REFS         6         53        56
    12  FSTRT       REAL        ARRAY     RLSVK     REFS         8        108   DEFINED       102
    74  FTMO        REAL        ARRAY     RLSVK     REFS         8        109   DEFINED       104
   641  I           INTEGER                         REFS        32         40      2*44        45        47      2*53        64
                                                      65      2*71         77        78        83        84      2*92      2*94
                                                   2*102     2*104        108       109       111       112
                                                 DEFINED        31         39        52        63        70        77        78
                                                      83        84         91       101       108       109       111       112
     2  ICOUNT      INTEGER               RESTR     REFS         7         50        53        56
     0  ID          INTEGER               DOBK      REFS         4         57
     0  IMAN        INTEGER               RDSTR     REFS         6         36        38
     0  IREST       INTEGER               RESTR     REFS         7         75        81        87        97       107       110
   644  J           INTEGER                         REFS        44         45       109       112   DEFINED        37       109
                                                     112
     0  JDL         INTEGER               SCAN3     REFS        10         46
     1  JRESTO      INTEGER               RESTR     REFS         7
   654  K           INTEGER                         REFS        78         84      2*94     2*104   DEFINED        78        84
                                                      93       103
   647  LBAD        INTEGER                         REFS        66         68        69        71   DEFINED        62        66
   642  MM          INTEGER                         REFS        37    DEFINED        34        36
   643  MN          INTEGER                         REFS        36         37   DEFINED        35
     1  MNTO        INTEGER               SZBK      REFS        11         34
   650  MSTRT       INTEGER                         REFS        70    DEFINED        69
     0  MXN         INTEGER               AMBLK     REFS         3         39
     0  MXTO        INTEGER               SZBK      REFS        11         35
   145  NFSTRT      INTEGER               RLSVK     REFS         8        101       108       109   DEFINED       100
     2  NOO         INTEGER     ARRAY     RDSTR     REFS         6         50
   144  NRSTRT      INTEGER               RLSVK     REFS         8         91       111       112   DEFINED        90
   640  NSTRT       INTEGER                         REFS        60         61        63        69        74
                                                 DEFINED        30         47        55        60
   653  NSTRT1      INTEGER                         REFS        77         78   DEFINED        76
   655  NSTRT2      INTEGER                         REFS        83         84   DEFINED        82
   646  NUMO        INTEGER                         REFS        51         52        55   DEFINED        50
     1  NUMS        INTEGER               RDSTR     REFS         6
     0  NXSTRT      INTEGER     ARRAY     RLSVK     REFS         5         76        82        90       100
     0  RSTRT       REAL        ARRAY     RLSVK     REFS         8        111   DEFINED        92
    24  RTMO        REAL        ARRAY     RLSVK     REFS         8        112   DEFINED        94
   656  STRT        REAL        ARRAY               REFS         2         44        45      2*65        71        74
                                                 DEFINED        32         41        44        53        56        58        59
                                                      71
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        SUBROUTINE XMSTR        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE      4

VARIABLES      SN  TYPE              RELOCATION
    2  XSTRT       REAL        ARRAY    FLSVK         REFS           5          77         83         92         102
   26  XTMO        REAL        ARRAY    FLSVK         REFS           5          78         84         94         104
    0  XXT         REAL                   F.P.        REFS          41          58         59      DEFINED         1

FILE NAMES         MODE
       TAPE6       FMT                      WRITES          77          78         79         83         84         85        108        109
                                              111          112

EXTERNALS             TYPE    ARGS           REFERENCES
       CONSEQ                    4               74

INLINE FUNCTIONS      TYPE    ARGS           DEF LINE  REFERENCES
       FLOAT        REAL        1  INTRIN                   44          45         46

STATEMENT LABELS                     DEF LINE    REFERENCES
  422  1                               106          37          97          98
  100  2                                48          39        2*46
    0  4                                33          31
    0  5              INACTIVE          89        2*88
    0  6              INACTIVE          47          46
    0  8                                95          91          93
   66  9                                45          42
   61  10                               43          40
  105  11                               50          38
  210  12                               73          49          57          61         68
    0  13                               54          52
  124  14                               55          51
  166  20                               67          63          64          65
    0  21                               72          70
  364  40                               96          88
    0  42             INACTIVE          99        2*98
    0  43                              105         101         103
  260  50                               80          75
  326  51                               86          81
  365  52                               97          87
  461  53                              110         107
  514  54                              113         110
  522  1000       FMT                   12         108         109         111        112
  524  2000       FMT                   13          79          85
  532  3000       FMT                   14          77
  537  4000       FMT                   15          78          84
  544  5000       FMT                   16          83

LOOPS  LABEL      INDEX      FROM-TO      LENGTH     PROPERTIES
   26  4            I        31 33          5B      INSTACK
   45  1          * J        37 106       360B                   EXT REFS  NOT INNER
   52  2            I        39 48         31B         OPT
  113  13           I        52 54         10B         OPT
  154  20           I        63 67         15B         OPT
  200  21           I        70 72          7B      INSTACK
  222             * I        77 77          7B                   EXT REFS
  236             * I        78 78         15B                   EXT REFS  NOT INNER
  237             * K        78 78         11B                   EXT REFS
  270             * I        83 83          7B                   EXT REFS
  304             * I        84 84         15B                   EXT REFS  NOT INNER
  305             * K        84 84         11B                   EXT REFS
  342  8          * I        91 95         21B                   NOT INNER
```

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          SUBROUTINE XMSTR       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE      5

LOOPS  LABEL      INDEX       FROM-TO      LENGTH    PROPERTIES
  347  8          K            93 95         11B          OPT
  400  43       * I           101 105        21B                  NOT INNER
  405  43         K           103 105        11B          OPT
  441           * I           109 109        15B                  EXT REFS  NOT INNER
  442           * J           109 109        11B                  EXT REFS
  474           * I           112 112        15B                  EXT REFS  NOT INNER
  475           * J           112 112        11B                  EXT REFS

COMMON BLOCKS    LENGTH        MEMBERS - BIAS NAME(LENGTH)
       AMBLK          1                     0 MXN     (1)
       DOBK           1                     0 ID      (1)
       FLSVK        102                     0 NXSTRT  (2)                 2 XSTRT   (20)                 22 XTMO    (80)
       RDSTR         72                     0 IMAN    (1)                 1 NUMS    (1)                   2 NOO     (10)
                                           12 CSTRT   (60)
       RESTR          3                     0 IREST   (1)                 1 JRESTQ  (1)                   2 ICOUNT  (1)
       RLSVK        102                     0 RSTRT   (10)               10 FSTRT   (10)                 20 RTMO    (40)
                                           60 FTMO    (40)              100 NRSTRT  (1)                 101 NFSTRT  (1)
       SCAN3          1                     0 JDL     (1)
       SZBK           2                     0 MXTO    (1)                 1 MNTO    (1)

STATISTICS
  PROGRAM LENGTH                   702B      450
  CM LABELED COMMON LENGTH         434B      284
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```
      SUBROUTINE CONSEQ(STRT.NSTRT.CSMN.CFMN)
      DIMENSION IA(6).IB(6).ITP(6).TMO(10.4).STRT(10)
      COMMON /AMBLK/ MXN.IBN
      COMMON /CNT/ ICNT
      COMMON /COUNT/ICONT
      COMMON /DOBK/ ID.ITY.DT2Q.DT
      COMMON /FLSVK/ NXSTRT(2).XSTRT(2.10).XTMO(2.10.4)
      COMMON /FMBLK/ DHD.IIX(10.10).THK(10.10)
      COMMON /KAYBK/ IAXK
      COMMON /LCY/ AXK
      COMMON /NBLK/ NOGQ.NOHQ.NPTQ.NXQ.NYQ.NODQ.NOSGQ.XK
      COMMON /RDSTR/ IMAN.NUMS
      COMMON /RESTR/ IREST.JREST.ICOUNT
      COMMON /RODLOD/ IDR.L7.IDF
      COMMON /S7BK/ MXTOQ.MNTO
      COMMON /T1BK/ T1
      COMMON /XMBLK/ LIMT
 1000 FORMAT(/" CONSEQ-TOO MANY OVERLAYS")
 2000 FORMAT(5X.                     12F6.0)
 3000 FORMAT(5X.2F20.2)
 4000 FORMAT(2X.10(2X.I2))
 5000 FORMAT(25X." CONSEQ-  R-F-R COMBINATION")
C
C     THIS SUBROUTINE DILINEATES TYPES OF OVERLAYS. THE APPROPRIATE
C     MODULI OF SUBGRADE REACTION AND BONDING TYPE.   IT CALLS THE
C     ROUTINES THAT CALCULATE OVERLAY THICKNESSES AND COSTS OF MAINTENANCE
C     (AIRCRAFT AND PAVEMENT) AND SAVES THE CHEAPEST TYPE ARRANGEMENT
C     FOR EACH STRATEGY.
C     CSMN IS DISCOUNTED MAINTENANCE COST.
C
00000 ICONT=0
      WRITE(6.4000) ICNT.ICOUNT
      IF(MXN.GT.6) WRITE(6.1000)
      IF(NSTRT.GT.MXN) WRITE(6.1000)
      IF(NSTRT.GT.6) STOP 3111
      IF(IAXK.EQ.1) WRITE(6.2000) AXK.XK
      IF(IAXK.NE.1) WRITE(6.2000) XK
      CSN=10000000000.
      CSP=10000000000.
      DO 2 LLIT=1.LIMT
      IF((IREST.GT.1).AND.(ID.NE.1)) GO TO 50
      IF(LIMT.EQ.1) DHD=DT
      IF(LIMT.EQ.1) GO TO 30
      ITY=LLIT
 50   NX=INT(STRT(1)+.1)-MNTO+1
      IF(IMAN.EQ.2) NX=ICNT
      IF(ID.EQ.3) NX=1
      DHD=THK(1.NX)
      IF(ITY.EQ.2) GO TO 31
      DT=DHD+T1
      GO TO 32
 31   DT=0,
      NXX=IIX(1.NX)
      DO 33 LMIT=2.NXX
      DT=DT+THK(LMIT.NX)
 33   CONTINUE
 32   CONTINUE
```

```
   30   CONTINUE
        NBX=6-NSTRT
        IX=1
        DO 1 I=1,6
        IA(I)=1
        IB(I)=2
        IF(JREST.GT.1) IA(I)=JREST-1
        IF((JREST.GT.1).OR.(I.LE.NBX)) IB(I)=IA(I)
    1   CONTINUE
        IA1=IA(1)
        IB1=IB(1)
        DO 2 I1=IA1,IB1
        ITP(1)=I1
        IA2=IA(2)
        IB2=IB(2)
        DO 2 I2=IA2,IB2
        ITP(2)=I2
        IA3=IA(3)
        IB3=IB(3)
        DO 2 I3=IA3,IB3
        ITP(3)=I3
        IA4=IA(4)
        IB4=IB(4)
        DO 2 I4=IA4,IB4
        ITP(4)=I4
        IA5=IA(5)
        IB5=IB(5)
        DO 2 I5=IA5,IB5
        ITP(5)=I5
        IA6=IA(6)
        IB6=IB(6)
        DO 2 I6=IA6,IB6
        ITP(6)=I6
        IF(NSTRT.EQ.0)GO TO 37
        DO 8 I=1,NSTRT
        J=I+NBX
        TMO(I,1)=FLOAT(ITP(J))
        IF(I.GE.NSTRT) GO TO 9
        IF(ID.EQ.1.AND.ITP(J).NE.2) IDI=IDR
        IF(ID.EQ.2.AND.ITP(J).NE.2) IDI=IDR
        IF(ITP(J).EQ.2) GO TO 6
        IF(I.GT.1) GO TO 10
        TMO(1,4)=XK
        IF((ITY.EQ.2).AND.(IAXK.EQ.1)) TMO(1,4)=AXK
        IF((ITY.EQ.2).AND.(IAXK.NE.1)) GO TO 2
        TMO(2,4)=TMO(1,4)
        GO TO 9
   10   TMO(I+1,4)=TMO(I,4)
        GO TO 9
    6   IF(ID.EQ.1.AND.ITP(J).EQ.2) IDI=IDF
        IF(ID.EQ.2.AND.ITP(J).EQ.2) IDI=IDF
        IF(I.GT.1) GO TO 11
        TMO(1,4)=XK
        IF((ITY.EQ.2).AND.(IAXK.EQ.1)) TMO(1,4)=AXK
        IF((ITY.EQ.2).AND.(IAXK.NE.1).AND.(JREST.NE.3)) GO TO 2
   11   IF(IAXK.EQ.1) TMO(I+1,4)=AXK
        IF((IAXK.NE.1).AND.(JREST.NE.3)) GO TO 2
    9    IF(I.EQ.1) GO TO 200
         IF(I.GT.2) GO TO 34
         IF(ITY.EQ.2) GO TO 8
         IF(ITP(J-1).EQ.1) GO TO 8
         IF(ITP(J).EQ.2) GO TO 8
         IX=2
   34    CONTINUE
         KK=ITP(J-2)
         IF(KK.EQ.2) GO TO 8
         KK=ITP(J-1)
         IF(KK.EQ.1) GO TO 8
         KK=NBX+NSTRT
         DO 20 L=J.KK
         IF(ITP(L).EQ.1) IX=2
   20    CONTINUE
  200    CONTINUE
         IF((I.NE.NSTRT).OR.(I.NE.1)) GO TO 8
         TMO(1.4)=XK
         KK=ITP(J)
         IF((ITY.EQ.2).AND.(KK.EQ.1).AND.(IAXK.EQ.1)) TMO(1,4)=AXK
         IF((ITY.EQ.2).AND.(KK.EQ.1).AND.(IAXK.NE.1)) GO TO 2
    8    CONTINUE
         IF(IX.EQ.2) GO TO 36
         GO TO 37
   36    IX=1
         WRITE(6.5000)
   37    CONTINUE
         KBN=IBN
         JBN=IBN
         IF(NSTRT.EQ.0) GO TO 14
         IF(IBN.EQ.4) GO TO 13
         GO TO 14
   13    JBN=2
         KBN=3
   14    DO 40 I=JBN.KBN
         IF(NSTRT.EQ.0) GO TO 51
         DO 15 J=1.NSTRT
         TMO(J.3)=FLOAT(I)
   15    CONTINUE
         WRITE(6.2000) (STRT(LM).LM=1.NSTRT)
         WRITE(6.2000) ((TMO(LM.LN).LN=1,4),LM=1,NSTRT)
         CALL OVTHK(TMO.STRT.NSTRT.IDI)
   51    CALL MOAC(TMO.STRT.NSTRT.COM)
         CALL USRC(TMO.STRT.NSTRT.CTU)
         WRITE(6.2000) (STRT(LM).LM=1,NSTRT)
         WRITE(6.2000) ((TMO(LM.LN).LN=1,4),LM=1,NSTRT)
         WRITE(6.3000) COM.CTU
         CSM=COM+CTU
         IF(ITY.EQ.2) GO TO 100
         IF(CSM-CSN) 16.101.101
   16    CSN=CSM
         NXSTRT(1)=NSTRT
         DO 17 L=1.NSTRT
         XSTRT(1.L)=STRT(L)
         DO 17 M=1.4
         XTMO(1.L.M)=TMO(L.M)
   17    CONTINUE
```

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      SUBROUTINE CONSEQ     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE    4

                      101  GO TO 40
                      100  IF(CSM-CSP) 102,40,40
                      102  CSP=CSM
 175                       NXSTRT(2)=NSTRT
                           DO 104 L=1,NSTRT
                           XSTRT(2,L)=STRT(L)
                           DO 104 M=1,4
                           XTMO(2,L,M)=TMO(L,M)
 180                  104  CONTINUE
                      40   CONTINUE
                      2    CONTINUE
                           CSMN=CSN
                           CFMN=CSP
 185                       RETURN
                           END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE      REFERENCES
    4  CONSEQ          1           185

VARIABLES      SN  TYPE              RELOCATION
    0  AXK         REAL                   LCY       REFS        10        36       101       111       113       134
    0  CFMN        REAL                   F.P.   DEFINED         1       184
 1212  COM         REAL                             REFS       157       161       162
 1214  CSM         REAL                             REFS       164       165       173       174   DEFINED       162
    0  CSMN        REAL                   F.P.   DEFINED         1       183
 1147  CSN         REAL                             REFS       164       183   DEFINED        38       165
 1150  CSP         REAL                             REFS       173       184   DEFINED        39       174
 1213  CTU         REAL                             REFS       158       161       162
    0  DHD         REAL                  FMBLK      REFS         8        50   DEFINED        42        48
    3  DT          REAL                  DOBK       REFS         6        42        55   DEFINED        50        52        55
    2  DT2Q        REAL                  DOBK       REFS         6
 1157  I           INTEGER                          REFS        62        63        64      3*65        93        94        95
                                                      99     2*105       109       113       115       116     2*131       152
                                                 DEFINED        61        92       149
 1216  IA          INTEGER     ARRAY                REFS         2        65        67        71        75        79        83
                                                      87   DEFINED        62        64
    0  IAXK        INTEGER               KAYBK      REFS         9        36        37       101       102       111       112
                                                     113       114       134       135
 1160  IA1         INTEGER                          REFS        69   DEFINED        67
 1163  IA2         INTEGER                          REFS        73   DEFINED        71
 1166  IA3         INTEGER                          REFS        77   DEFINED        75
 1171  IA4         INTEGER                          REFS        81   DEFINED        79
 1174  IA5         INTEGER                          REFS        85   DEFINED        83
 1177  IA6         INTEGER                          REFS        89   DEFINED        87
 1224  IB          INTEGER     ARRAY                REFS         2        68        72        76        80        84        88
                                                 DEFINED        63        65
    1  IBN         INTEGER               AMBLK      REFS         3       142       143       145
 1161  IB1         INTEGER                          REFS        69   DEFINED        68
 1164  IB2         INTEGER                          REFS        73   DEFINED        72
 1167  IB3         INTEGER                          REFS        77   DEFINED        76
 1172  IB4         INTEGER                          REFS        81   DEFINED        80
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      SUBROUTINE CONSEQ      74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     5

VARIABLES      SN  TYPE            RELOCATION
  1175  IB5        INTEGER                         REFS        85  DEFINED       84
  1200  IB6        INTEGER                         REFS        89  DEFINED       88
     0  ICNT       INTEGER               CNT       REFS         4       32       46
     0  ICONT      INTEGER               COUNT     REFS         5  DEFINED       31
     2  ICOUNT     INTEGER               RESTR     REFS        13       32
     0  ID         INTEGER               DOBK      REFS         6       41       47       96       97      107      108
     2  IDF        INTEGER               RODLOD    REFS        14      107      108
  1203  IDI        INTEGER                         REFS       156  DEFINED       96       97      107      108
     0  IDR        INTEGER               RODLOD    REFS        14       96       97
     1  IIX        INTEGER      ARRAY    FMBLK     REFS         8       53
     0  IMAN       INTEGER               RDSTR     REFS        12       46
     0  IREST      INTEGER               RESTR     REFS        13       41
  1232  ITP        INTEGER      ARRAY              REFS         2       94       96       97       98      107      108
                                                    118       119      122      124      128      133
                                                DEFINED        70       74       78       82       86       90
     1  ITY        INTEGER               DOBK      REFS         6       49      101      102      111      112      117
                                                    134       135      163  DEFINED       44
  1156  IX         INTEGER                         REFS       137  DEFINED       60      120      128      139
  1162  I1         INTEGER                         REFS        70  DEFINED       69
  1165  I2         INTEGER                         REFS        74  DEFINED       73
  1170  I3         INTEGER                         REFS        78  DEFINED       77
  1173  I4         INTEGER                         REFS        82  DEFINED       81
  1176  I5         INTEGER                         REFS        86  DEFINED       85
  1201  I6         INTEGER                         REFS        90  DEFINED       89
  1202  J          INTEGER                         REFS        94       96       97       98      107      108      118
                                                    119       122      124      127      133      152
                                                DEFINED        93      151
  1207  JBN        INTEGER                         REFS       149  DEFINED      143      147
     1  JREST      INTEGER               RESTR     REFS        13     2*64       65      112      114
  1206  KBN        INTEGER                         REFS       149  DEFINED      142      148
  1204  KK         INTEGER                         REFS       123      125      127      134      135
                                                DEFINED       122      124      126      133
  1205  L          INTEGER                         REFS       128    2*168    2*170    2*177    2*179
                                                DEFINED       127      167      176
     0  LIMT       INTEGER               XMBLK     REFS        17       40       42       43
  1151  LLIT       INTEGER                         REFS        44  DEFINED       40
  1210  LM         INTEGER                         REFS       154      155      159      160  DEFINED      154      155
                                                    159       160
  1154  LMIT       INTEGER                         REFS        55  DEFINED       54
  1211  LN         INTEGER                         REFS       155      160  DEFINED      155      160
     1  LZ         INTEGER               RODLOD    REFS        14
  1215  M          INTEGER                         REFS     2*170    2*179  DEFINED      169      178
     1  MNTO       INTEGER               SZBK      REFS        15       45
     0  MXN        INTEGER               AMBLK     REFS         3       33       34
     0  MXTOQ      INTEGER               SZBK      REFS        15
  1155  NBX        INTEGER                         REFS        65       93      126  DEFINED       59
     5  NODQ       INTEGER               NBLK      REFS        11
     0  NOGQ       INTEGER               NBLK      REFS        11
     1  NOHQ       INTEGER               NBLK      REFS        11
     6  NOSGQ      INTEGER               NBLK      REFS        11
     2  NPTQ       INTEGER               NBLK      REFS        11
     0  NSTRT      INTEGER                F.P.     REFS        34       35       59       91       92       95      126
                                                    131       144      150      151      154      155      156      157
                                                    158       159      160      166      167      175      176
                                                DEFINED         1
     1  NUMS       INTEGER               RDSTR     REFS        12
  1152  NX         INTEGER                         REFS        48       53       55  DEFINED       45       46       47
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       SUBROUTINE CONSEQ      74/74    OPT=1 ROUND=*/ TRACE          FTN 4.6.420         09/02/77  13.54.00       PAGE      6

VARIABLES      SN  TYPE              RELOCATION
    3  NXQ        INTEGER                 NBLK         REFS         11
    0  NXSTRT     INTEGER     ARRAY       FLSVK        REFS          7    DEFINED       166       175
 1153  NXX        INTEGER                              REFS         54    DEFINED        53
    4  NYQ        INTEGER                 NBLK         REFS         11
    0  STRT       REAL        ARRAY        F.P.        REFS          2         45       154       156       157       158       159
                                                        168        177    DEFINED         1
  145  THK        REAL        ARRAY       FMBLK        REFS          8         48        55
 1240  TMO        REAL        ARRAY                    REFS          2        103       105       155       156       157       158
                                                        160        170        179   DEFINED        94       100       101       103
                                                        105        110        111       113       132       134       152
    0  T1         REAL                    T1BK         REFS         16         50
    7  XK         REAL                    NBLK         REFS         11         36        37       100       110       132
    2  XSTRT      REAL        ARRAY       FLSVK        REFS          7    DEFINED       168       177
   26  XTMO       REAL        ARRAY       FLSVK        REFS          7    DEFINED       170       179

FILE NAMES        MODE
      TAPE6       FMT                         WRITES         32         33         34        36        37       140       154       155
                                                159         160        161

EXTERNALS              TYPE      ARGS         REFERENCES
      MOAC                         4             157
      OVTHK                        4             156
      USRC                         4             158

INLINE FUNCTIONS       TYPE      ARGS          DEF LINE  REFERENCES
      FLOAT           REAL         1  INTRIN                  94        152
      INT             INTEGER      1  INTRIN                  45

STATEMENT LABELS                       DEF LINE   REFERENCES
    0  1                                   66         61
  772  2                                  182         40         69         73         77        81        85        89       102       112
                                                     114        135
  343  6                                  107         98
  523  8                                  136         92        117        118        119       123       125       131
  417  9                                  115         95        104        106
  337  10                                 105         99
  405  11                                 113        109
  552  13                                 147        145
  556  14                                 149        144        146
    0  15                                 153        151
    0  16            INACTIVE             165        164
    0  17                                 171        167        169
    0  20                                 129        127
  144  30                                  58         43
  123  31                                  52         49
  143  32                                  57         51
    0  33                                  56         54
  440  34                                 121        116
  533  36                                 139        137
  537  37                                 141         91        138
  766  40                                 181        149        172      2*173
   73  50                                  45         41
  627  51                                 157        150
  734  100                                173        163
  732  101                                172      2*164
    0  102           INACTIVE             174        173
    0  104                                180        176        178
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      SUBROUTINE CONSEQ       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00          PAGE      7

STATEMENT LABELS                    DEF LINE    REFERENCES
   471  200                           130          115
  1044  1000     FMT                   18           33         34
  1051  2000     FMT                   19           36         37          154          155          159          160
  1053  3000     FMT                   20          161
  1055  4000     FMT                   21           32
  1060  5000     FMT                   22          140

LOOPS  LABEL       INDEX       FROM-TO      LENGTH     PROPERTIES
    55  2         * LLIT        40 182       742B                 EXT REFS  NOT INNER
   132  33          LMIT        54 56         10B            OPT
   153  1           I           61 66         21B            OPT
   202  2         * I1          69 182       612B                 EXT REFS  NOT INNER
   212  2         * I2          73 182       577B                 EXT REFS  NOT INNER
   222  2         * I3          77 182       564B                 EXT REFS  NOT INNER
   232  2         * I4          81 182       551B                 EXT REFS  NOT INNER
   242  2         * I5          85 182       536B                 EXT REFS  NOT INNER
   252  2         * I6          89 182       523B                 EXT REFS  NOT INNER
   260  8         * I           92 136       246B                   EXITS   NOT INNER
   461  20          L          127 129         7B        INSTACK
   560  40        * I          149 181       211B                 EXT REFS  NOT INNER
   564  15          J          151 153         6B        INSTACK
   603            * LM         155 155        15B                 EXT REFS  NOT INNER
   604            * LN         155 155        11B                 EXT REFS
   650            * LM         160 160        15B                 EXT REFS  NOT INNER
   651            * LN         160 160        11B                 EXT REFS
   710  17        * L          167 171        21B                 NOT INNER
   715  17          M          169 171        11B            OPT
   744  104       * L          176 180        21B                 NOT INNER
   751  104         M          178 180        11B            OPT

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       AMBLK          2                  0 MXN     (1)                  1 IBN     (1)
       CNT            1                  0 ICNT    (1)
       COUNT          1                  0 ICONT   (1)
       DOBK           4                  0 ID      (1)                  1 ITY     (1)                    2 DT2Q    (1)
                                         3 DT      (1)
       FLSVK        102                  0 NXSTRT  (2)                  2 XSTRT   (20)                  22 XTMO    (80)
       FMBLK        201                  0 DHD     (1)                  1 IIX     (100)                101 THK     (100)
       KAYBK          1                  0 IAXK    (1)
       LCY            1                  0 AXK     (1)
       NBLK           8                  0 NOGQ    (1)                  1 NOHQ    (1)                    2 NPTQ    (1)
                                         3 NXQ     (1)                  4 NYQ     (1)                    5 NODQ    (1)
                                         6 NOSGQ   (1)                  7 XK      (1)
       RDSTR          2                  0 IMAN    (1)                  1 NUMS    (1)
       RESTR          3                  0 IREST   (1)                  1 JREST   (1)                    2 ICOUNT  (1)
       RODLOD         3                  0 IDR     (1)                  1 LZ      (1)                    2 IDF     (1)
       SZBK           2                  0 MXTOQ   (1)                  1 MNTO    (1)
       TIBK           1                  0 T1      (1)
       XMBLK          1                  0 LIMT    (1)

STATISTICS
  PROGRAM LENGTH                    1354B      748
  CM LABELED COMMON LENGTH           515B      333
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```
      SUBROUTINE OVTHK(TMO,STRT,NSTRT,IDI)
      DIMENSION STRT(10),TMO(10,4)
      COMMON /AMBLK/ MXN,IBN
      COMMON /BMBLK/ TRA(20),TRAA(20)
      COMMON /CNT/ ICNT
      COMMON /COND/ ICOND
      COMMON /DOBK/ ID,ITY,DT2Q,DT
      COMMON /FCON/ IFCON
      COMMON /FLAG/ JCOND
      COMMON /FMBLK/ DHD,IIX(10,10),THK(10,10)
      COMMON /HBLK/ HH(10),TM(20),AHH(10)
      COMMON /IABLK/ FACCQ,FACNQ,LTQ,IA
      COMMON /KAYBK/ IAXK
      COMMON /LCY/ AXK,YKQ,TRYQ(20),FACQ,LS
      COMMON /LYTO/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSBB,XMT(10,6),
     1NB,ZMT(3,4)
      COMMON /MTO/OMTF,OMTR
      COMMON /NBLK/ NOGQ,NOH,NPTQ,NXQ,NYQ,NODQ,NOSGQ,XK
      COMMON /RDSTR/ IMAN
      COMMON /RESTR/ IRESTQ,JRESTQ,ICOUNT
      COMMON /ROOLOD/ IOR,LZ,LOF
      COMMON /SCAN3/ JDL
      COMMON /S7HK/ MXTO,MNTO
      COMMON /THKHK/ THFF(20),TRKK(20)
      COMMON /TYPBK/ LMH,LFUNC
 1000 FORMAT(2X,10F6.0)
 2000 FORMAT(/" OVTHK-OPTION REQUIRES THAT IAXK = 1 ")
      WRITE(6,1000) DHD,DT
      JCOND=1
      TTHS=DT
      DO 1 I=1,NSTRT
      IF(I.GT.1) GO TO 2
      ITYPL=ITY
      HD=DHD
      ISYS=ITYPL
      GO TO 3
    2 ITYPL=INT(TMO(I-1,2)+.1)
    3 CONTINUE
      IF(I.LT.NSTRT) GO TO 4
      TN=FLOAT(JDL)
      GO TO 5
    4 TN=STRT(I+1)
    5 CONTINUE
      TL=STRT(I)
      ITYPN=INT(TMO(I,1)+.1)
      THL=HD
      IB=INT(TMO(I,3)+.1)
      IF(ISYS.EQ.2) GO TO 8
      KK=LS
      CALL GINT(TRKK,TM,TN,HD,KK,20)
      HD=AINT(HD+.74)
      HHH=HD-THL
      IF(HHH.LE.1.) HD=THL+1.
      IF(ITYPN.EQ.2) GO TO 19
      ISYS=1
      IF(IB.GT.2) GO TO 14
      WRITE(6,1000) HD,DHD,THL,DT
      IF(ICOND.EQ.1) C=1.
      IF(ICOND.EQ.2) C=.75
      IF(ICOND.FQ.3) C=.5
      IF(ICOND.EQ.4) C=.35
      IF(I.NE.1.O.ID.NE.1) C=1.
      THL=THL*C
      OTH=((HD**1.4)-((THL)**1.4))**(1./1.4)
      THL=THL/C
      IF(OTH-OMTR) 13,11,11
13    OTH=OMTR
      THL=THL*C
      HD=((OTH**1.4)+(THL**1.4))**(1./1.4)
      THL=THL/C
      GO TO 11
14    IF(ICOND.EQ.1) C=1.
      IF(ICOND.EQ.2) C=.75
      IF(ICOND.EQ.3) C=.5
      IF(ICOND.EQ.4) C=.35
      IF(I.NE.1.O.ID.NE.1) C=1.
      OTH=SORT((HD**2)-((C*THL)**2))
      IF(OTH-OMTR) 16,11,11
16    OTH=OMTR
      THL=THL*C
      HD=SQRT((OTH**2)+(THL**2))
      THL=THL/C
      GO TO 11
19    CONTINUE
      ISYS=1
      YAK=TMO(I,4)
      F=1.
      IF(IFCON.EQ.2) GO TO 100
      CALL FF(YAK,LFUNC,IA,F)
100   CONTINUE
      IF(ICOND.EQ.1) C=1.
      IF(ICOND.EQ.2) C=1.
      IF(ICOND.FQ.3) C=.75
      IF(I.NE.1.O.ID.NE.1) C=1.
      IF(ICOND.EQ.4.A.I.EQ.1.A.ID.EQ.1) JCOND=2
      IF(ICOND.EQ.4.A.I.EQ.1.A.ID.EQ.1) OTH=99.
      IF(ICOND.EQ.4.A.I.EQ.1.A.ID.EQ.1) GO TO 41
      OTH=2.5*(F*HD-C*THL)
      IF(OTH-OMTF) 20,41,41
20    OTH=OMTF
      HD=(.4*OTH+C*THL)/F
41    CONTINUE
      IF(LZ.EQ.3)GO TO 50
      IBASE=1
      ISB=2
      IPBQ=1
      CALL TLMM(LMH,LFUNC,IBASE,ISB,IPBQ,TLIM)
      IF(OTH-4.1-TLIM) 11,11,23
23    KK=LS
      TLFT=TN-TL
      CALL GINT(THFF,TM,TLFT,AP,KK,20)
      THO=AP-TTHS
      BP=0.
      IF(NNAT.EQ.0) GO TO 42
```

```
115                  DO 40 JJ=1,NNAT
                     BP=BP+YCBR(JJ,3)
               40    CONTINUE
                     THO=THO-BP
               42    IF(THO-OTH) 24,11,11
120            24    OTH=THO
                     ISYS=2
                     IF(OTH-OMTF) 33,34,34
               33    OTH=OMTF
               34    GO TO 11
125            50    KLASS=LFUNC
                     CBRL=100.
                     CALL MTHICK(IDI,CBRL,THIKENS,KLASS,BASET)
                     TLIM=THIKENS
                     IF(OTH-BASET-TLIM)11,11,23
130            8     CONTINUE
                     IF(ITYPN.EQ.2) GO TO 25
                     ISYS=1
                     IF(IAXK.NE.1) TMO(I,2)=99.
                     IF(IAXK.NE.1) WRITE(6,2000)
135                  IF(IAXK.NE.1) GO TO 11
                     CALL HDO(TN,TL,OTH)
                     IF(OTH-OMTR) 26,27,27
               26    OTH=OMTR
               27    CONTINUE
140                  HD=OTH
                     GO TO 11
               25    CONTINUE
                     ISYS=2
                     KK=LS
145                  CALL GINT(THFF,TM,TN,AP,KK,20)
                     KK=LS
                     CALL GINT(THFF,TM,TL,CP,KK,20)
                     OTH=AP-CP
                     KK=LS
150                  CALL GINT(TRKK,TM,TN,HD,KK,20)
                     IF(OTH-OMTF) 28,11,11
               28    OTH=OMTF
               11    CONTINUE
                     OTH=AINT(OTH+.74)
155                  TTHS=TTHS+OTH
                     TMO(I,2)=OTH
               1     CONTINUE
                     RETURN
                     END


          SYMBOLIC REFERENCE MAP (R=3)

      ENTRY POINTS      DEF LINE      REFERENCES
         4  OVTHK           1          158
```

```
     SUBROUTINE OVTHK       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

VARIABLES     SN  TYPE            RELOCATION
  36 AHH          REAL        ARRAY   HBLK          REFS      11
1006 AP           REAL                              REFS     111       112       145       148
   0 AXK          REAL                LCY           REFS      14
1015 BASET        REAL                              REFS     127       129
1010 BP           REAL                              REFS     116       118   DEFINED       113       116
 775 C            REAL                              REFS      63        65        68        70        77        80        82
                                                      98     101   DEFINED        58        59        60        61        62
                                                      72      73        74        75        76        91        92        93
                                                      94
1013 CBRL         REAL                              REFS     127   DEFINED       126
1016 CP           REAL                              REFS     147       148
   0 DHD          REAL                FMBLK         REFS      10        28        34        57
   3 DT           REAL                DOBK          REFS       7        28        30        57
   2 DT2Q         REAL                DOBK          REFS       7
1000 F            REAL                              REFS      89        98       101   DEFINED        87
   0 FACCQ        REAL                IABLK         REFS      12
   1 FACNQ        REAL                IABLK         REFS      12
  26 FACQ         REAL                LCY           REFS      14
 764 HD           REAL                              REFS      46        50        51        52        57        64        77
                                                      98     150   DEFINED        34        51        53        69        81
                                                     101     140
   0 HH           REAL        ARRAY   HBLK          REFS      11
 774 HHH          REAL                              REFS      53   DEFINED        52
 762 I            INTEGER                           REFS      32        37        39        42        44        45        47
                                                      62      76        86        94        95        96        97       133
                                                     156 DEFINED        31
   3 IA           INTEGER             IABLK         REFS      12        89
   0 IAXK         INTEGER             KAYBK         REFS      13       133       134       135
 772 IB           INTEGER                           REFS      56   DEFINED        47
1001 IBASE        INTEGER                           REFS     107   DEFINED       104
   1 IBN          INTEGER             AMBLK         REFS       3
   0 ICNT         INTEGER             CNT           REFS       5
   0 ICOND        INTEGER             COND          REFS       6        58        59        60        61        72        73
                                                      74      75        91        92        93        95        96        97
   2 ICOUNT       INTEGER             RESTR         REFS      20
   0 ID           INTEGER             DORK          REFS       7        62        76        94        95        96        97
   0 IDI          INTEGER             F.P.          REFS     127   DEFINED         1
   0 IDR          INTEGER             RODLOD        REFS      21
   0 IFCON        INTEGER             FCON          REFS       8        88
   1 IIX          INTEGER     ARRAY   FMBLK         REFS      10
   0 IMAN         INTEGER             RDSTR         REFS      19
1003 IPBQ         INTEGER                           REFS     107   DEFINED       106
   0 IRESTQ       INTEGER             RESTR         REFS      20
1002 ISB          INTEGER                           REFS     107   DEFINED       105
 765 ISYS         INTEGER                           REFS      48   DEFINED        35        55        85       121       132
                                                     143
   1 ITY          INTEGER             DORK          REFS       7        33
 763 ITYPL        INTEGER                           REFS      35   DEFINED        33        37
 770 ITYPN        INTEGER                           REFS      54       131   DEFINED        45
   0 JCOND        INTEGER             FLAG          REFS       9   DEFINED        29        95
   0 JDL          INTEGER             SCAN3         REFS      22        40
1011 JJ           INTEGER                           REFS     116   DEFINED       115
   1 JRESTQ       INTEGER             RESTR         REFS      20
 773 KK           INTEGER                           REFS      50       111       145       147       150
                                                 DEFINED      49       109       144       146       149
1012 KLASS        INTEGER                           REFS     127   DEFINED       125
```

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      SUBROUTINE OVTHK       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00         PAGE      5

VARIABLES      SN  TYPE             RELOCATION
     2  LDF        INTEGER              RODLOD         REFS         21
     1  LFUNC      INTEGER              TYPBK          REFS         25        89       107       125
     0  LMH        INTEGER              TYPBK          REFS         25       107
    27  LS         INTEGER              LCY            REFS         14        49       109       144       146       149
     2  LTQ        INTEGER              IABLK          REFS         12
     1  LZ         INTEGER              RODLOD         REFS         21       103
     1  MNTO       INTEGER              SZBK           REFS         23
     0  MXN        INTEGER              AMBLK          REFS          3
     0  MXTO       INTEGER              SZBK           REFS         23
   243  NB         INTEGER              LYTD           REFS         15
    51  NCOM       INTEGER              LYTD           REFS         15
     0  NNAT       INTEGER              LYTD           REFS         15       114       115
     5  NODQ       INTEGER              NBLK           REFS         18
     0  NOGQ       INTEGER              NBLK           REFS         18
     1  NOH        INTEGER              NBLK           REFS         18
     6  NOSGQ      INTEGER              NBLK           REFS         18
     2  NPTQ       INTEGER              NBLK           REFS         18
   146  NSBB       INTEGER              LYTD           REFS         15
     0  NSTRT      INTEGER               F.P.          REFS         31        39   DEFINED         1
     3  NXQ        INTEGER              NBLK           REFS         18
     4  NYQ        INTEGER              NBLK           REFS         18
     0  OMTF       REAL                 MTO            REFS         17        99       100       122       123       151       152
     1  OMTR       REAL                 MTO            REFS         17        66        67        78        79       137       138
   776  OTH        REAL                                REFS         66        69        78        81        99       101       108
                                                        119        122       129       136       137       140       151       154
                                                        155        156   DEFINED        64        67        77        79        96
                                                         98        100       120       123       138       148       152       154
     0  STRT       REAL        ARRAY     F.P.          REFS          2        42        44   DEFINED         1
     0  THFF       REAL        ARRAY    THKBK          REFS         24       111       145       147
  1014  THIKENS    REAL                                REFS        127       128
   145  THK        REAL        ARRAY    FMBLK          REFS         10
   771  THL        REAL                                REFS         52        53        57        63        64        65        68
                                                         69         70        77        80        81        82        98       101
                                                    DEFINED         46        63        65        68        70        80        82
  1007  THO        REAL                                REFS        118       119       120   DEFINED       112       118
   767  TL         REAL                                REFS        110       136       147   DEFINED        44
  1005  TLFT       REAL                                REFS        111   DEFINED       110
  1004  TLIM       REAL                                REFS        107       108       129   DEFINED       128
    12  TM         REAL        ARRAY    HBLK           REFS         11        50       111       145       147       150
     0  TMO        REAL        ARRAY     F.P.          REFS          2        37        45        47        86
                                                    DEFINED          1       133       156
   766  TN         REAL                                REFS         50       110       136       145       150
                                                    DEFINED         40        42
     0  TRA        REAL        ARRAY    BMBLK          REFS          4
    24  TRAA       REAL        ARRAY    BMBLK          REFS          4
    24  TRKK       REAL        ARRAY    THKBK          REFS         24        50       150
     2  TRYQ       REAL        ARRAY    LCY            REFS         14
   761  TTHS       REAL                                REFS        112       155   DEFINED        30       155
     7  XK         REAL                 NBLK           REFS         18
   147  XMT        REAL        ARRAY    LYTD           REFS         15
   777  YAK        REAL                                REFS         89   DEFINED        86
     1  YCBR       REAL        ARRAY    LYTD           REFS         15       116
     1  YKQ        REAL                 LCY            REFS         14
    52  ZCBR       REAL        ARRAY    LYTD           REFS         15
   244  ZMT        REAL        ARRAY    LYTD           REFS         15
```

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       SUBROUTINE OVTHK      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      6

FILE NAMES        MODE
       TAPE6     FMT                    WRITES        28        57       134

EXTERNALS          TYPE   ARGS       REFERENCES
       FF                   4            89
       GINT                 6            50       111       145       147       150
       MTHICK               5           127
       RDO                  3           136
       SQRT      REAL       1 LIBRARY    77        81
       TLMM                 6           107

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       AINT      REAL       1  INTRIN             51        154
       FLOAT     REAL       1  INTRIN             40
       INT       INTEGER    1  INTRIN             37        45        47

STATEMENT LABELS              DEF LINE   REFERENCES
    0  1                          157        31
   41  2                           37        32
   45  3                           38        36
   54  4                           42        39
   57  5                           43        41
  510  8                          130        48
  574  11                         153      2*66        71      2*78        83     2*108     2*119       124     2*129       135
                                            141     2*151
    0  13          INACTIVE        67        66
  215  14                          72        56
    0  16          INACTIVE        79        78
  273  19                          84        54
    0  20          INACTIVE       100        99
  421  23                         109       108       129
    0  24          INACTIVE       120       119
  545  25                         142       131
    0  26          INACTIVE       138       137
  541  27                         139     2*137
    0  28          INACTIVE       152       151
    0  33          INACTIVE       123       122
  467  34                         124     2*122
    0  40                         117       115
  401  41                         102        97      2*99
  453  42                         119       114
  471  50                         125       103
  310  100                         90        88
  714  1000    FMT                 26        28        57
  716  2000    FMT                 27       134

LOOPS  LABEL    INDEX     FROM-TO    LENGTH     PROPERTIES
   26  1      * I         31 157      5638                EXT REFS  NOT INNER
  441  40       JJ       115 117        68       INSTACK

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       AMBLK         2              0 MXN      (1)                  1 IBN     (1)
       BMBLK        40              0 TRA      (20)                20 TRAA    (20)
       CNT           1              0 ICNT     (1)
       COND          1              0 ICOND    (1)
       DOBK          4              0 ID       (1)                  1 ITY     (1)                    2 DT2Q    (1)
                                    3 DT       (1)
```

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      SUBROUTINE OVTHK       74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE      7

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
      FCON            1                 0 IFCON   (1)
      FLAG            1                 0 JCOND   (1)
      FMBLK         201                 0 DHD     (1)                  1 IIX     (100)             101 THK     (100)
      HBLK           40                 0 HH      (10)                10 TM      (20)               30 AHH     (10)
      IABLK           4                 0 FACCQ   (1)                  1 FACNO   (1)                 2 LTQ     (1)
                                        3 IA      (1)
      KAYBK           1                 0 IAXK    (1)
      LCY            24                 0 AXK     (1)                  1 YKQ     (1)                 2 TRYQ    (20)
                                       22 FACQ    (1)                 23 LS      (1)
      LYTD          176                 0 NNAT    (1)                  1 YCBR    (40)               41 NCOM    (1)
                                       42 ZCBR    (60)               102 NSBB    (1)               103 XMT     (60)
                                      163 NB      (1)                164 ZMT     (12)
      MTO             2                 0 OMTF    (1)                  1 OMTR    (1)
      NBLK            8                 0 NOGQ    (1)                  1 NOH     (1)                 2 NPTQ    (1)
                                        3 NXQ     (1)                  4 NYQ     (1)                 5 NODQ    (1)
                                        6 NOSGQ   (1)                  7 XK      (1)
      RDSTR           1                 0 IMAN    (1)
      RESTR           3                 0 IRESTQ  (1)                  1 JRESTQ  (1)                 2 ICOUNT  (1)
      RODLOD          3                 0 IDR     (1)                  1 LZ      (1)                 2 LDF     (1)
      SCAN3           1                 0 JDL     (1)
      SZBK            2                 0 MXTO    (1)                  1 MNTO    (1)
      THKBK          40                 0 THFF    (20)                20 TRKK    (20)
      TYPBK           2                 0 LMH     (1)                  1 LFUNC   (1)

STATISTICS
  PROGRAM LENGTH                 10368      542
  CM LABELED COMMON LENGTH       10568      558
```

```
     SUBROUTINE EXCOST3    74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     1

 1                   SUBROUTINE EXCOST3 (BSTK,TPAV)
                     DIMENSION SAVER(50,2)
                     COMMON /TMPL/ IND,SWID,TWOCL,JACK
                     COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
 5                   COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
                    1OT
                     THCK=BSTK+TPAV
                     IF (NERTH.EQ.0) GO TO 2
                     IF (NERTH.GT.50) GO TO 2
10                   DO 50 IK=1,NERTH
                  50 IF (ABS(SAVER(IK,1)-THCK).LT.0.1) GO TO 55
                     GO TO 2
                  55 ERCOST=SAVER(IK,2)
                     GO TO 99
15                 2 CUT=CUTCST=FILL=FILCST=0.0
                     I=0
                     REWIND 2
              1      B=A
                     READ(2) A
20                   IFL=EOF(2)
                     IF(IFL.NE.0)GO TO 10
                     I=I+1
                     A=A-SWID*THCK/36
                     IF(I.EQ.1)GO TO 1
25                   VOL=0.5*(A+B)*PSTEP/3
                     IF(VOL.GT.0.0)FILL=FILL+VOL
                     IF(VOL.LT.0.0)CUT=CUT+VOL
                     GO TO 1
             10      CUT=ABS(CUT)
30                   CUTCST=CUT*CUTPRCE
                     FILCST=FILL*FILPRCE
                     ERCOST=CUTCST+FILCST+APTOT
                     NERTH=NERTH+1
                     SAVER(NERTH,1)=THCK
35                   SAVER(NERTH,2)=ERCOST
                  99 CONTINUE
                     RETURN
                     END


     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  EXCOST3          1          37

VARIABLES      SN  TYPE            RELOCATION
   160  A            REAL                                    REFS      18        23        25   DEFINED       19        23
    55  APREND       REAL        ARRAY     ZONES             REFS       5
    22  APRSTR       REAL        ARRAY     ZONES             REFS       5
   111  APTOT        REAL                  ZONES             REFS       5        32
    11  APWID        REAL        ARRAY     ZONES             REFS       5
   157  B            REAL                                    REFS      25   DEFINED        18
     0  BSTK         REAL                   F.P.             REFS       7   DEFINED         1
   152  CUT          REAL                                    REFS      27        29        30   DEFINED       15        27        29
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       SUBROUTINE EXCOST3    74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      2

VARIABLES     SN  TYPE           RELOCATION
  153  CUTCST    REAL                             REFS         32    DEFINED        15        30
    4  CUTPRCE   REAL                TSV          REFS          4         30
    1  ERCOST    REAL                TSV          REFS          4         35   DEFINED        13        32
  155  FILCST    REAL                             REFS         32    DEFINED        15        31
  154  FILL      REAL                             REFS         26         31   DEFINED        15        26
    3  FILPRCE   REAL                TSV          REFS          4         31
  156  I         INTEGER                          REFS         22         24   DEFINED        16        22
  161  IFL       INTEGER                          REFS         21    DEFINED        20
  151  IK        INTEGER                          REFS         11         13   DEFINED        10
    0  IND       INTEGER             TMPL         REFS          3
    3  JACK      INTEGER             TMPL         REFS          3
  110  NAPR      INTEGER             ZONES        REFS          5
    5  NERTH     INTEGER             TSV          REFS          4          8         9        10        33        34        35
                                                DEFINED        33
    2  PSTEP     REAL                TSV          REFS          4         25
  163  SAVER     REAL       ARRAY                 REFS          2         11        13   DEFINED        34        35
    1  SWID      REAL                TMPL         REFS          3         23
    0  THCK      REAL                TSV          REFS          4         11        23        34   DEFINED         7
    0  TPAV      REAL                 F.P.        REFS          7    DEFINED         1
    2  TWOCL     REAL                TMPL         REFS          3
  162  VOL       REAL                             REFS       2*26       2*27   DEFINED        25
    0  ZONSTEP   REAL       ARRAY    ZONES        REFS          5

FILE NAMES        MODE
       TAPE2     UNFMT                  READS         19    MOTION         17

EXTERNALS          TYPE   ARGS       REFERENCES
       EOF       REAL       1            20

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       ABS       REAL       1  INTRIN                   11        29

STATEMENT LABELS             DEF LINE   REFERENCES
   46  1                          18         24        28
   36  2                          15          8         9        12
  107  10                         29         21
    0  50                         11         10
   32  55                         13         11
  134  99                         36         14

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   20  50     * IK          10 11       108        OPT     EXITS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       TMPL          4                 0 IND    (1)                   1 SWID   (1)                      2 TWOCL  (1)
                                       3 JACK   (1)
       TSV           6                 0 THCK   (1)                   1 ERCOST (1)                      2 PSTEP  (1)
                                       3 FILPRCE(1)                   4 CUTPRCE(1)                      5 NERTH  (1)
       ZONES        74                 0 ZONSTEP(9)                   9 APWID  (9)                     18 APRSTR (27)
                                      45 APREND (27)                 72 NAPR   (1)                     73 APTOT  (1)

STATISTICS
  PROGRAM LENGTH                3278        215
  CM LABELED COMMON LENGTH      1248         84
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```
      SUBROUTINE DRNAGE3 (BSTK,TPAV)
      COMMON/BSBLK/IBTE,FDE,BTE,GBM
      COMMON/BSBLK2/FDEF
      COMMON/DRNBLK/DRNCST,DRAIN
      COMMON /DRNBLK2/IDGWTO,IDIPO,EPO,DLO,PERMO,H30,LENGTHO,CAVCSTO,
     1FILCSTO,PIPCSTO,SLO,RNO,NOUTO,LOUTO
      COMMON /SA/ALOS,WOS
      DRNCST=0.0
      H2F=0.0
      H2WT=0.0
      KDFLAG=0
      DGWT=FLOAT(IDGWTO)
      DIP=FLOAT(IDIPO)
      EP=EPO
      DL=DLO
      PERM=PERMO
      H3=H30+BSTK
      IF(LENGTHO.EQ.0)LENGTHO=IFIX(ALOS+.001)
      LENGTH=LENGTHO
      CAVCST=CAVCSTO
      FILCST=FILCSTO
      PIPECST=PIPCSTO
      SL=SLO
      RN=RNO
      NOUT=NOUTO
      LOUT=LOUTO
      IF((IBTE.EQ.5).OR.(IBTE.EQ.6))FDE=FDEF
      T=BSTK+TPAV
      IF(DRAIN.EQ.2)GO TO 10
      IF(T.LT.FDE)GO TO 20
    1 IF(T+12.0.GE.DGWT)GO TO 30
    2 IF(KDFLAG.GT.0)GO TO 40
      DRNCST=0.0
      WRITE(6,2000)
 2000 FORMAT("  DRNAGE3- NO DRAINAGE REQUIRED")
      RETURN
   10 DTP=DIP
      IF(DTP.GE.(T+12.0))GO TO 50
      DTP=T+12.0
      GO TO 50
   20 H2F=FDE+6.0-T
      IF(H2F.LT.12.0)H2F=12.0
      KDFLAG=10
      GO TO 1
   30 H2WT=12.0
      KDFLAG=10
      GO TO 2
   40 IF(H2WT.GT.H2F)GO TO 41
      DTP=H2F+T
      GO TO 50
   41 DTP=H2WT+T
   50 TIME=(12*EP*DL**2)/(2880*PERM*H3)
      IF(TIME.GT.10.0)GO TO 51
      FCTR=2.0
      GO TO 52
   51 DL=DL/2
      H3=BSTK+0.5*(H3-BSTK)
    SUBROUTINE DRNAGE3    74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     2

                             FCTR=4.0
                          52 Q=(PERM*BSTK*H3)/(60*DL*144)
         60                  R=((257.*Q*RN)/SL**.5)**.375
                             IF(R.LT.3.0)R=3.0
                             GO TO (60,61,62),NOUT+1
                        61   NOUT=AINT(( LENGTH+500)/1000.+1)
                             SLENGTH=DL*2*NOUT
         65                  IF(FCTR.EQ.4.)SLENGTH=SLENGTH*2
                             GO TO 60
                        62   NOUT=AINT(( LENGTH+500)/1000.+1     )
                             SLENGTH=DL*NOUT
                             IF(FCTR.EQ.2.)SLENGTH=0
         70             60   EXCAV=(DTP-T+6.0+R)*(12.+2*R)*LENGTH*12
                             FILTER=EXCAV-(3.14159*R**2.)*LENGTH*12
                             EXCAV=EXCAV/46656
                             FILTER=FILTER/46656
                             EXCVCST=EXCAV*CAVCST
         75                  FMCST=FILTER*FILCST
                             PIPCST=LENGTH*PIPECST
                             CSTLF=(EXCVCST+FMCST+PIPCST)/LENGTH
                             DRNCST=CSTLF*(FCTR*(LENGTH+NOUT*LOUT)+SLENGTH)
                             WRITE(6,1000)T,FDE,H2F,DGWT,H2WT,DTP,TIME,FCTR,Q,R,DL,NOUT,DRNCST
         80             1000 FORMAT( " DRNAGE3-- T,FDE,H2F,DGWT,H2WT,DTP,TIME,FCTR,Q,R,DL,NOUT,
                            1DRNCST"/2X,6(F5.1,2X),F6.3,2X,F2.0,2X,F7.3,2X,3(F6.1,2X),F10.2)
                             RETURN
                             END


  CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

       62     I                AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.


         SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE     REFERENCES
      4  DRNAGE3        1          36        82

  VARIABLES      SN  TYPE             RELOCATION
      0  ALOS        REAL               SA          REFS        7       18
      0  BSTK        REAL                F.P.       REFS       17       28       2*57      59    DEFINED      1
      2  BTE         REAL               BSBLK       REFS        2
    455  CAVCST      REAL                           REFS       74    DEFINED     20
      7  CAVCSTO     REAL               DRNBLK2     REFS        5       20
    500  CSTLF       REAL                           REFS       78    DEFINED     77
    446  DGWT        REAL                           REFS       31       79    DEFINED     12
    447  DIP         REAL                           REFS       37    DEFINED     13
    451  DL          REAL                           REFS       52       56       59      64       68        79
                                                  DEFINED      15       56
      3  DLO         REAL               DRNBLK2     REFS        5       15
      1  DRAIN       REAL               DRNBLK      REFS        4       29
      0  DRNCST      REAL               DRNBLK      REFS        4       79    DEFINED      8       33        78
      SUBROUTINE DRNAGE3    74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420       09/02/77  13.54.00       PAGE     3

VARIABLES      SN  TYPE            RELOCATION
 465 DTP         REAL                             REFS        38        70        79   DEFINED        37        39        49
                                                    51
 450 EP          REAL                             REFS        52   DEFINED        14
   2 EPO         REAL              DRNBLK2        REFS         5        14
 473 EXCAV       REAL                             REFS        71        72        74   DEFINED        70        72
 475 EXCVCST     REAL                             REFS        77   DEFINED        74
 467 FCTR        REAL                             REFS        65        69        78        79   DEFINED        54        58
   1 FDE         REAL              BSBLK          REFS         2        30        41        79   DEFINED        27
   0 FDEF        REAL              BSBLK2         REFS         3        27
 456 FILCST      REAL                             REFS        75   DEFINED        21
  10 FILCSTO     REAL              DRNBLK2        REFS         5        21
 474 FILTER      REAL                             REFS        73        75   DEFINED        71        73
 476 FMCST       REAL                             REFS        77   DEFINED        75
   3 GBM         REAL              BSBLK          REFS         2
 443 H2F         REAL                             REFS        42        48        49        79   DEFINED         9        41
                                                    42
 444 H2WT        REAL                             REFS        48        51        79   DEFINED        10        45
 453 H3          REAL                             REFS        52        57        59   DEFINED        17        57
   5 H30         REAL              DRNBLK2        REFS         5        17
   0 IBTE        INTEGER           BSBLK          REFS         2      2*27
   0 IDGWTO      INTEGER           DRNBLK2        REFS         5        12
   1 IDIPO       INTEGER           DRNBLK2        REFS         5        13
 445 KDFLAG      INTEGER                          REFS        32   DEFINED        11        43        46
 454 LENGTH      INTEGER                          REFS        63        67        70        71        76        77        78
                                               DEFINED        19
   6 LENGTHO     INTEGER           DRNBLK2        REFS         5        18        19   DEFINED        18
 463 LOUT        INTEGER                          REFS        78   DEFINED        26
  15 LOUTO       INTEGER           DRNBLK2        REFS         5        26
 462 NOUT        INTEGER                          REFS        62        64        68        78        79
                                               DEFINED        25        63        67
  14 NOUTO       INTEGER           DRNBLK2        REFS         5        25
 452 PERM        REAL                             REFS        52        59   DEFINED        16
   4 PERMO       REAL              DRNBLK2        REFS         5        16
 477 PIPCST      REAL                             REFS        77   DEFINED        76
  11 PIPCSTO     REAL              DRNBLK2        REFS         5        22
 457 PIPECST     REAL                             REFS        76   DEFINED        22
 470 Q           REAL                             REFS        60        79   DEFINED        59
 471 R           REAL                             REFS        61      2*70        71        79   DEFINED        60        61
 461 RN          REAL                             REFS        60   DEFINED        24
  13 RNO         REAL              DRNBLK2        REFS         5        24
 460 SL          REAL                             REFS        60   DEFINED        23
 472 SLENGTH     REAL                             REFS        65        78   DEFINED        64        65        68        69
  12 SLO         REAL              DRNBLK2        REFS         5        23
 464 T           REAL                             REFS        30        31        38        39        41        49        51
                                                    70        79   DEFINED        28
 466 TIME        REAL                             REFS        53        79   DEFINED        52
   0 TPAV        REAL              F.P.           REFS        28   DEFINED         1
   1 WOS         REAL              SA             REFS         7

FILE NAMES         MODE
     TAPE6         FMT                WRITES        34        79

INLINE FUNCTIONS   TYPE    ARGS        DEF LINE  REFERENCES
     AINT          REAL      1  INTRIN            63        67
     FLOAT         REAL      1  INTRIN            12        13
     IFIX          INTEGER   1  INTRIN            18
```

```
          SUBROUTINE DRNAGE3     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00         PAGE     4

STATEMENT LABELS                     DEF LINE   REFERENCES
   77  1                                31        44
  103  2                                32        47
  113  10                               37        29
  126  20                               41        30
  140  30                               45        31
  146  40                               48        32
  155  41                               51        48
  160  50                               52        38          40          50
  174  51                               56        53
  205  52                               59        55
  275  60                               70        62          66
  237  61                               63        62
  257  62                               67        62
  405  1000      FMT                    80        79
  360  2000      FMT                    35        34

COMMON BLOCKS   LENGTH       MEMBERS - BIAS NAME(LENGTH)
        BSBLK        4                   0 IRTE    (1)             1 FDE     (1)                 2 BTE     (1)
                                         3 GHM     (1)
        BSBLK2       1                   0 FDEF    (1)
        DRNBLK       2                   0 DRNCST  (1)             1 DRAIN   (1)
        DRNBLK2     14                   0 IDGWTO  (1)             1 IDIPO   (1)                 2 EPO     (1)
                                         3 DLO     (1)             4 PERMO   (1)                 5 H30     (1)
                                         6 LENGTHO(1)              7 CAVCSTO(1)                  8 FILCSTO(1)
                                         9 PIPCSTO(1)             10 SLO     (1)                11 RNO     (1)
                                        12 NOUTO   (1)            13 LOUTO   (1)
        SA           2                   0 ALOS    (1)             1 WOS     (1)

STATISTICS
  PROGRAM LENGTH                      501B      321
  CM LABELED COMMON LENGTH             27B       23
```

```
      SUBROUTINE MTHICK      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE      1

  1                     SUBROUTINE MTHICK(DI,CBR,THIKNS,LFUNC,BASET)
                         INTEGER ITA(6)
                        INTEGER DI,KLASS
                        REAL C100P(10),C100B(10),C80P(10),C80B(10),C50P(10)
  5                     DATA ITA/1HA,1HB,1HC,1HD,1HE,1HF/
                        DATA C100P/0.5,1,1.5,1.5,2.,2.,2.5,3.,3.,3.5/
                        DATA C100B/6.,3*5.,6*4./
                        DATA C80P/.5,1.5,1.5,2.,2.5,3.,3.,3.5,3.5,4./
                        DATA C80B/6.,5.,5.,7*4./
 10                     DATA C50P/2.,2.5,2.5,3.,3.5,4.,4.,4.5,4.5,5./
                   1000 FORMAT(" MTHICK-INPUT CBR 50 GENERALLY FOR E AND F CLASS ONLY ")
                  C     THE INFORMATION USED BY SUBROUTINE MTHICK IS MODIFIED FROM
                  C     FLEXIBLE PAVEMENTS FOR ROADS, STREETS, WALKS, AND OPEN STORAGE
                  C     AREAS. TM 5-822-5 (DEPARTMENT OF THE ARMY, JUNE 1971), CHAPTER 3,
 15               C     TABLE II.
                        KLASS=ITA(LFUNC)
                        ITEST =    0
                        IF( CBR .LT. 80.0) ICBR=3
                        IF((CBR .GE. 80.0) .AND. (CBR .LT. 100.0)) ICBR=2
 20                     IF( CBR .GE. 100.0) ICBR=1
                        IF((KLASS .EQ. 1HE)  .OR.  (KLASS .EQ. 1HF)) ITEST=1
                        IF((ITEST  .EQ.  1) .OR.  (ICBR  .NE.  3)) GO TO 1
                        WRITE(6,1000)
                      1 GO TO (100,200,300),ICBR
 25                 100 THIKNS=C100P(DI)
                        BASET=C100B(DI)
                        RETURN
                    200 THIKNS=C80P(DI)
                        BASET=C80B(DI)
 30                     RETURN
                    300 THIKNS=C50P(DI)
                        BASET = 4.0
                        RETURN
                        END


   CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      24    I                    AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.


        SYMBOLIC REFERENCE MAP (R=3)

   ENTRY POINTS    DEF LINE     REFERENCES
      4  MTHICK          1         27        30        33

   VARIABLES       SN  TYPE            RELOCATION
       0  BASET        REAL                  F.P.    DEFINED       1        26        29        32
       0  CBR          REAL                  F.P.       REFS      18      2*19        20     DEFINED       1
     144  C100B        REAL       ARRAY                 REFS       4        26   DEFINED         7
     132  C100P        REAL       ARRAY                 REFS       4        25   DEFINED         6
     202  C50P         REAL       ARRAY                 REFS       4        31   DEFINED        10
```

```
      SUBROUTINE MTHICK      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE            RELOCATION
  170  C80B         REAL        ARRAY                    REFS         4        29    DEFINED         9
  156  C80P         REAL        ARRAY                    REFS         4        28    DEFINED         8
    0  DI           INTEGER               F.P.           REFS         3        25         26        28         29         31
                                                      DEFINED         1
  123  ICBR         INTEGER                              REFS        22        24    DEFINED        18         19         20
  124  ITA          INTEGER     ARRAY                    REFS         2        16    DEFINED         5
  122  ITEST        INTEGER                              REFS        22   DEFINED         17        21
  121  KLASS        INTEGER                              REFS         3      2*21    DEFINED        16
    0  LFUNC        INTEGER               F.P.           REFS        16   DEFINED          1
    0  THIKNS       REAL                  F.P.        DEFINED         1        25         28        31

FILE NAMES          MODE
      TAPE6         FMT                     WRITES       23

STATEMENT LABELS                DEF LINE   REFERENCES
   46  1                          24         22
   57  100                        25         24
   66  200                        28         24
   75  300                        31         24
  102  1000      FMT              11         23

STATISTICS
  PROGRAM LENGTH                  214B       140
```

```
SUBROUTINE RODDENS    74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE    1

  1                     SUBROUTINE RODDENS(IDI,DEN,ICOH,DEP)
                        REAL PRTC(2),PRTN(2),COM(2),PRT(2)
                        DIMENSION DOCC(10),DONC(10),DOCE(10),RLC(2),RLN(2),RL(2)
                        DATA (DOCE(J),J=1,10)/2.6,3.1,3.4,4.,4.4,5.,5.3,5.8,6.4,6.9/
  5                     DATA (DONC(J),J=1,10)/35.,41.5,48.,53.73,60.4,66.6,72.1,78.,84.8,9
                       11.1/
                        DATA (DOCC(J),J=1,10)/19.6,23.2,26.8,30.1,33.7,37.35,40.75,44.1,47
                       1.9,50.83/
                        DATA RLC/52.18,0./,RLN/79.9998,103.7/
 10                     DATA PRTC/79.9998,101.5/,PRTN/79.9998,103.7/
                        COM(2)=DOCE(IDI)
                        IF(ICOH.EQ.1.OR.ICOH.EQ.3) GO TO 3
                        DO 30 I=1,2
               30       PRT(I)=PRTC(I)
 15                     COM(1)=DOCC(IDI)
                        RL(1)=RLC(1)
                        RL(2)=RLC(2)
                        GO TO 6
                3       CONTINUE
 20                     DO 31 I=1,2
               31       PRT(I)=PRTN(I)
                        COM(1)=DONC(IDI)
                        RL(1)=RLN(1)
                        RL(2)=RLN(2)
 25             6       CONTINUE
                        KK=2
                        CALL GINT(RL,PRT,DEN,S,KK,2)
                        KK=2
                        CALL GINT(COM,RL,S,DEP,KK,2)
 30                     RETURN
                        END


          SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   4  RODDENS         1            30

VARIABLES       SN  TYPE              RELOCATION
  116  COM          REAL      ARRAY                      REFS        2       29   DEFINED       11        15        22
    0  DEN          REAL                 F.P.            REFS       27  DEFINED         1
    0  DEP          REAL                 F.P.            REFS       29  DEFINED         1
  122  DOCC         REAL      ARRAY                      REFS        3       15   DEFINED        7
  145  DOCE         REAL      ARRAY                      REFS        3       11   DEFINED        4
  134  DONC         REAL      ARRAY                      REFS        3       22   DEFINED        5
  107  I            INTEGER                              REFS     2*14     2*21   DEFINED       13        20
    0  ICOH         INTEGER              F.P.            REFS     2*12  DEFINED         1
    0  IDI          INTEGER              F.P.            REFS       11       15        22   DEFINED        1
  110  KK           INTEGER                              REFS       27       29   DEFINED       26        28
  120  PRT          REAL      ARRAY                      REFS        2       27   DEFINED       14        21
  112  PRTC         REAL      ARRAY                      REFS        2       14   DEFINED       10
  114  PRTN         REAL      ARRAY                      REFS        2       21   DEFINED       10
  164  RL           REAL      ARRAY                      REFS        3       27        29   DEFINED       16        17        23
                                                               24
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      SUBROUTINE RODDENS    74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420      09/02/77  13.54.00       PAGE    2

VARIABLES      SN  TYPE            RELOCATION
  160  RLC         REAL        ARRAY                      REFS       3        16        17   DEFINED       9
  162  RLN         REAL        ARRAY                      REFS       3        23        24   DEFINED       9
  111  S           REAL                                   REFS      27        29

EXTERNALS              TYPE    ARGS         REFERENCES
      GINT                       6              27         29

STATEMENT LABELS                  DEF LINE   REFERENCES
   35  3                             19         12
   53  6                             25         18
    0  30                            14         13
    0  31                            21         20

LOOPS  LABEL     INDEX      FROM-TO     LENGTH    PROPERTIES
   20   30         I         13 14          4B     INSTACK
   37   31         I         20 21          4B     INSTACK

STATISTICS
  PROGRAM LENGTH                   166B      118
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```
SUBROUTINE PECHART     74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     1

    1                   SUBROUTINE PECHART(Y,TA)
                        REAL U(99),U1(72),V(99),V1(72)
                        DATA U/1.33,1.,.98,.96,.94,.92,.9,.88,.86,.84,.82,.8,.78,.76,.74,.   A  58
                       172,.7,.68,.66,.64,.62,.6,.59,.58,.57,.56,.55,.54,.53,.52,.51,.5,.4   A  59
    5                  29,.48,.47,.46,.45,.44,.43,.42,.41,.4,.39,.38,.37,.36,.35,.34,.33,.   A  60
                       332,.31,.3,.29,.28,.27,.26,.25,.24,.23,.22.0.21,.2,.195,.19,.185,.1   A  61
                       48,.175,.17,.165,.16,.155,.15,.145,.14,.135,.13,.125,.12,.115,.11,.   A  62
                       5105,.1,.098,.096,.094,.092,.09,.088,.086,.084,.082,.08,.078,.076,.   A  63
                       6074,.072,.07,.068,.066/
   10                   DATA V/0.,.048,.05,.055,.06,.061,.065,.07,.078,.08,.085,.099,.1,.1   A  70
                       103,.11,.118,.12,.127,.13,.14,.15,.158,.164,.168,.17,.178,.18,.185,   A  71
                       2.19,.194,.2,.205,.21,.218,.22,.23,.24,.242,.25,.255,.26,.27,.278,.   A  72
                       3287,.297,.302,.312,.321,.33,.342,.355,.37,.38,.395,.41,.428,.44,.4   A  73
                       46,.48,.5,.521,.55,.56,.572,.59,.601,.62,.63,.65,.67,.69,.708,.728,   A  74
   15                  5.742,.765,.785,.815,.84,.87,.9,.93,.958,.97,.985,1.,1.02,1.032,1.0   A  75
                       645,1.065,1.08,1.1,1.115,1.13,1.15,1.178,1.19,1.21,1.23,1.25/
                        DATA V1/                                               1.25,1.27,1   A  76
                       7.29,1.318,1.331,1.34,1.355,1.37,1.382,1.4,1.412,1.43,1.445,1.46,1.   A  77
                       8475,1.495,1.513,1.53,1.55,1.57,1.59,1.612,1.632,1.65,1.678,1.71,1.   A  78
   20                  973,1.76,1.82,1.881,1.95,1.985,2.023,2.063,2.105,2.149,2.197,2.247,   A  79
                       $2.298,2.358,2.42,2.486,2.557,2.635,2.72,2.813,2.915,3.029,3.157,3.   A  80
                       $302,3.468,3.66,3.888,4.162,4.321,4.501,4.704,4.938,5.208,5.528,5.9   A  81
                       $13,6.39,7.007,7.837,8.381,9.056,9.924,11.098,11.87,12.82,14.05,15.   A  82
                       $7/
   25                   DATA U1/.066,.064,.062,.06,.059,.058,.057,.056,.055,.054,
                       7.053,.052,.051,.05,.049,.048,.047,.046,.045,.044,.043,.042,.041,.  A  65
                       804,.039,.038,.037,.036,.034,.032,.03,.029,.028,.027,.026,.025,.024   A  66
                       9,.023,.022,.021,.02,.019,.018,.017,.016,.015,.014,.013,.012,.011,.   A  67
                       $01,.009,.008,.007,.0065,.006,.0055,.005,.0045,.004,.0035,.003,.002   A  68
   30                  $5,.002,.00175,.0015,.00125,.001,.000875,.00075,.000625,.0005/
                        IF(Y.GE..066) GO TO 11
                        KK=72
                        CALL GINT(V1,U1,Y,TA,KK,72)
                        GO TO 10
   35              11   KK=99
                        CALL GINT(V,U,Y,TA,KK,99)
                   10   CONTINUE
                        RETURN
                        END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  PECHART        1            38

VARIABLES       SN  TYPE            RELOCATION
     53  KK         INTEGER                        REFS         33        36    DEFINED        32        35
      0  TA         REAL                 F.P.      REFS         33        36    DEFINED         1
     54  U          REAL        ARRAY              REFS          2        36    DEFINED         3
    217  U1         REAL        ARRAY              REFS          2        33    DEFINED        25
    327  V          REAL        ARRAY              REFS          2        36    DEFINED        10
    472  V1         REAL        ARRAY              REFS          2        33    DEFINED        17
      0  Y          REAL                 F.P.      REFS         31        33         36    DEFINED         1
      SUBROUTINE PECHART    74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00       PAGE     2

EXTERNALS           TYPE   ARGS          REFERENCES
      GINT                  6                33          36

STATEMENT LABELS               DEF LINE   REFERENCES
    31  10                        37          34
    22  11                        35          31

STATISTICS
  PROGRAM LENGTH                 602B     386
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```
    SUBROUTINE RODTHK      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     1

  1                SUBROUTINE RODTHK(COVRGD.LS.TRKK)
                   REAL COVRGD(20).TRKK(20)
                   REAL PCTS(13).LOGCOV(13)
             C     THE INFORMATION USED BY SUBROUTINE RODTHK IS TAKEN FROM
  5          C     DEVELOPMENT OF RIGID PAVEMENT THICKNESS REQUIREMENTS FOR MILITARY
             C     ROADS AND STREETS.  TECHNICAL REPORT NO. 4-18 (OHIO RIVER DIVISION
             C     LABORATORIES. 1961).  FIGURES 2 AND 3.
             C THIS CARD IS THE PERCENTAGE OF THE 5000 COVERAGE PAVT THICKNESS
                   DATA (PCTS(I).I=1.13)/.75..958.1.045.1.1.1.153.1.195.1.235.1.284.
 10               A1.327.1.374.1.4295.1.5.1.591/
             C THIS CARD IS THE LOG OF THE TRAFFIC COVERAGES.
                   DATA (LOGCOV(I).I=1.13)/0..6.908.9.903.11.408.12.612.13.459.
                  A14.221.15.068.15.761.16.455.17.217.18.064.19.022/
                   DO 10 I=1.LS
 15                COV = COVRGD(I)
                   DUM = ALOG(COV)
                   KK = 13
                   CALL GINT(PCTS.LOGCOV.DUM.PERCNTS.KK.13)
             10    TRKK(I) = PERCNTS
 20                RETURN
                    END


    SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   4  RODTHK          1           20

VARIABLES      SN  TYPE             RELOCATION
   53  COV         REAL                              REFS        16    DEFINED     15
    0  COVRGD      REAL        ARRAY     F.P.        REFS         2       15    DEFINED        1
   54  DUM         REAL                              REFS        18    DEFINED     16
   52  I           INTEGER                           REFS        15       19    DEFINED       14
   55  KK          INTEGER                           REFS        18    DEFINED     17
   74  LOGCOV      REAL        ARRAY                 REFS         3       18    DEFINED       12
    0  LS          INTEGER               F.P.        REFS        14    DEFINED      1
   57  PCTS        REAL        ARRAY                 REFS         3       18    DEFINED        9
   56  PERCNTS     REAL                              REFS        18       19
    0  TRKK        REAL        ARRAY     F.P.        REFS         2    DEFINED      1           19

EXTERNALS          TYPE    ARGS       REFERENCES
      ALOG         REAL     1 LIBRARY      16
      GINT                  6              18

STATEMENT LABELS             DEF LINE    REFERENCES
   0  10                        19           14

LOOPS  LABEL    INDEX      FROM-TO     LENGTH     PROPERTIES
   20  10     * I           14 19        17B                   EXT REFS

STATISTICS
  PROGRAM LENGTH                117B       79
```

```
SUBROUTINE FF          74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00          PAGE    1

            SUBROUTINE FF(YAK,LFUNC,IA,F)
            DIMENSION F1(16),F2(16),F3(16),F4(16),AK(16)
            DATA F1 /.99,.97,.96,.94,.93,.915,.90,.885,.87,.86,.845,.83,.81,
           1.79,.765,.74/
            DATA F2 /.98,.96,.94,.92,.90,.885,.87,.86,.845,.83,.81,.795,.775,
           1.75,.725,.695/
            DATA F3 /.975,.95,.92,.90,.88,.86,.845,.83,.81,.795,.775,.75,.735,
           1.705,.675,.65/
            DATA F4 /.95,.82,.75,.695,.65,.61,.58,.56,.535,.51,.475,.44,.41,
           1.4,.4,.4/
      C     THE INFORMATION USED BY SUBROUTINE FF IS TAKEN FROM
      C     RIGID PAVEMENTS FOR AIRFIELDS OTHER THAN ARMY, TM 5-824-3
      C     (DEPARTMENT OF THE ARMY, 7 DECEMBER 1970), FIGURE 15.
       1000 FORMAT(/" INADMISSIBLE LFUNC FOR FF ")
            DO 1 I=1,16
            AK(I)=25.*FLOAT(I)
          1 CONTINUE
            IF(IA.EQ.1) GO TO 2
            IF(LFUNC.GT.1) GO TO 3
            LL=16
            KK=16
            CALL GINT (F2,AK,YAK,F,KK,LL)
            GO TO 5
          3 IF(LFUNC.LT.4) GO TO 4
            IF(LFUNC.EQ.4) GO TO 6
            WRITE(6,1000)
          6 KK=16
            LL=16
            CALL GINT(F4,AK,YAK,F,KK,LL)
            GO TO 5
          2 CONTINUE
            IF(LFUNC.GT.1) GO TO 4
            KK=16
            LL=16
            CALL GINT(F1,AK,YAK,F,KK,LL)
            GO TO 5
          4 CONTINUE
            IF(LFUNC.LT.4) GO TO 7
            WRITE(6,1000)
          7 KK=16
            LL=16
            CALL GINT(F3,AK,YAK,F,KK,LL)
          5 CONTINUE
            RETURN
            END


  SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE      REFERENCES
   4  FF             1           44
```

```
       SUBROUTINE FF        74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00      PAGE      2

VARIABLES     SN  TYPE            RELOCATION
  272 AK         REAL       ARRAY                 REFS         2        22        29        35        42
                                                DEFINED       16
    0 F          REAL                 F.P.        REFS        22        29        35        42   DEFINED         1
  172 F1         REAL       ARRAY                 REFS         2        35    DEFINED        3
  212 F2         REAL       ARRAY                 REFS         2        22    DEFINED        5
  232 F3         REAL       ARRAY                 REFS         2        42    DEFINED        7
  252 F4         REAL       ARRAY                 REFS         2        29    DEFINED        9
  167 I          INTEGER                          REFS      2*16    DEFINED       15
    0 IA         INTEGER              F.P.        REFS        18    DEFINED        1
  171 KK         INTEGER                          REFS        22        29        35        42   DEFINED        21        27
                                                    33        40
    0 LFUNC      INTEGER              F.P.        REFS        19        24        25        32        38
                                                DEFINED        1
  170 LL         INTEGER                          REFS        22        29        35        42   DEFINED        20        28
                                                    34        41
    0 YAK        REAL                 F.P.        REFS        22        29        35        42   DEFINED         1

FILE NAMES        MODE
       TAPE6    FMT                    WRITES       26        39

EXTERNALS          TYPE   ARGS       REFERENCES
       GINT                 6             22        29        35        42

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       FLOAT     REAL       1  INTRIN               16

STATEMENT LABELS             DEF LINE   REFERENCES
    0 1                         17        15
   61 2                         31        18
   37 3                         24        19
   77 4                         37        24        32
  116 5                         43        23        30        36
   47 6                         27        25
  105 7                         40        38
  153 1000     FMT              14        26        39

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   10  1        I           15 17        68     INSTACK

STATISTICS
  PROGRAM LENGTH                3128     202
```

```
      SUBROUTINE PREVENT(TMO,STRT,NSTRT,DTCTAL,MM)
      INTEGER    INDXRF(35)
      DIMENSION STRT(10),TMO(10,4)
      COMMON /DOBK/IDQ,ITY,DUM, DT
      COMMON /NDXRF/ INDXRF
      COMMON /PRVNT1/ ISKIP
      COMMON /SCAN3/ JDL
      COMMON /T1BK/ T1
      IF(ISKIP.EQ.1) GO TO 100
      DO  101  I=1,35
  101 INDXRF(I)=3
      ICHECK=0
      KK=1
      MAXYR=JDL
      TTSLCT=0.
      TTCRPT=0.
      TCLNDRN=0.
      TCLNSWP=0.
      TTOT=0.
      TDTOT=0.
      XREPAIR=0.
      XSLJNT=0.
      XRESLAB=0.
      XCLEAN=0.
      XDISTOT=0.
      XTOTAL=0.
      INDXRF(JDL)=2
      DO 502 J=1,NSTRT
  502 INDXRF(INT(STRT(J)+.01))=INT(TMO(J,1)+.01)
      I=1
      TRKK=DT-T1
      IF(ITY.EQ.2) TRKK=0.
      IEND=0
      IF((ITY.EQ.1)                      ) GO TO 3702
 3699 IF((INDXRF(I).EQ.1)) GO TO 3701
 3700 I=I+1
      IF(I.GE.MAXYR) GOTO 3705
      L=I-1
      IF(INDXRF(L).EQ.1.OR.ITY.EQ.1)ICHECK=1
      IF(ICHECK.EQ.1.A.INDXRF(L).NE.3) TRKK=TRKK+TMO(KK,2)
      IF (INDXRF(L).NE.3) KK=KK+1
      GOTO 3699
 3701 ISTART=IEND+1
      IEND=I
      CALL FLEXBL(TTSLCT,TTCRPT,TCLNDRN,TCLNSWP,TTOT,TDTOT,
     *             ISTART,IEND)
 3703 I=I+1
      IF(I.GE.MAXYR) GO TO 3706
 3702 IF(INDXRF(I).NE.2) GO TO 3703
 3704 ISTART=IEND+1
      IEND=I
      CALL RIGID(XREPAIR,XSLJNT,XRESLAB,XCLEAN,XDISTOT,XTOTAL, KK,
     *TRKK,        ISTART,IEND,TMO)
      GO TO 3700
 3705 IF(IEND.EQ.MAXYR) GOTO 3707
      GOTO 3701
 3706 IF(IEND.EQ.MAXYR) GOTO 3707
```

```
SUBROUTINE PREVENT    74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420       09/02/77  13.54.00       PAGE    2

                 GOTO 3704
            3707 TOTALS=TTOT+XTOTAL
 60              DTOTAL=XDISTOT+TDTOT
                 L=6
                 IF(MM.EQ.1)WRITE(L,2699)
            2699 FORMAT(///20X,"STRATEGY ANALYSIS SUMMARY")
                 WRITE(L, 2700)MM,TOTALS,DTOTAL
 65         2700 FORMAT(  ////5X,*TOTAL MAINTENANCE COST OF THE TRIAL *,I2,*  IS*
                ,,2X,*$*,F10.0//  5X,*TOTAL DISCOUNT MAINTENANCE COST OF THE SAME T
                .RIAL IS  $*,F10.0)
            100  CONTINUE
                 RETURN
 70              END



     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  PREVENT         1          69

VARIABLES      SN  TYPE              RELOCATION
    3  DT          PEAL                 DOBK        REFS         4        31
    0  DTOTAL      REAL                  F.P.       REFS        64   DEFINED         1        60
    2  DUM         PEAL                 DOBK        REFS         4
  326  I           INTEGER                          REFS        11        35        36        37        38        44        47
                                                      48        49        51   DEFINED        10        30        36        47
  327  ICHECK      INTEGER                          REFS        40   DEFINED        12        39
    0  IDO         INTEGER              DOBK        REFS         4
  350  IEND        INTEGER                          REFS        43        45        50        52        55        57
                                                 DEFINED        33        44        51
    0  INDXRF      INTEGER     ARRAY    NDXRF       REFS         2         5        35        39        40        41        49
                                                 DEFINED        11        27        29
    0  ISKIP       INTEGER              PRVNT1      REFS         6         9
  352  ISTART      INTEGER                          REFS        45        52   DEFINED        43        50
    1  ITY         INTEGER              DOBK        REFS·        4        32        34        39
  346  J           INTEGER                          REFS      2*29   DEFINED        28
    0  JDL         INTEGER              SCAN3       REFS         7        14        27
  330  KK          INTEGER                          REFS        40        41        52   DEFINED        13        41
  351  L           INTEGER                          REFS        39        40        41   DEFINED        38        61
                                                I/O REFS        62        64
  331  MAXYR       INTEGER                          REFS        37        48        55        57   DEFINED        14
    0  MM          INTEGER               F.P.       REFS        62        64   DEFINED         1
    0  NSTRT       INTEGER               F.P.       REFS        28   DEFINED         1
    0  STRT        PEAL        ARRAY     F.P.       REFS         3        29   DEFINED         1
  334  TCLNDRN     REAL                             REFS        45   DEFINED        17
  335  TCLNSWP     REAL                             REFS        45   DEFINED        18
  337  TDTOT       PEAL                             REFS        45        60   DEFINED        20
    0  TMO         PEAL        ARRAY     F.P.       REFS         3        29        40        52   DEFINED         1
  353  TOTALS      REAL                             REFS        64   DEFINED        59
  347  TRKK        REAL                             REFS        40        52   DEFINED        31        32        40
  333  TTCRPT      REAL                             REFS        45   DEFINED        16
  336  TTOT        REAL                             REFS        45        59   DEFINED        19
  332  TTSLCT      PEAL                             REFS        45   DEFINED        15
    0  T1          REAL                 T1BK        REFS         8        31
```

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     SUBROUTINE PREVENT    74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     3

VARIABLES      SN  TYPE            RELOCATION
  343  XCLEAN     REAL                               REFS        52   DEFINED        24
  344  XDISTOT    REAL                               REFS        52        60   DEFINED        25
  340  XREPAIR    REAL                               REFS        52   DEFINED        21
  342  XRESLAB    REAL                               REFS        52   DEFINED        23
  341  XSLJNT     REAL                               REFS        52   DEFINED        22
  345  XTOTAL     REAL                               REFS        52        59   DEFINED        26
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS           TYPE    ARGS         REFERENCES
       FLEXBL                 8               45
       RIGID                 11               52

INLINE FUNCTIONS    TYPE    ARGS         DEF LINE  REFERENCES
       INT         INTEGER    1  INTRIN                2*29

STATEMENT LABELS                  DEF LINE   REFERENCES
  241  100                            68          9
    0  101                            11         10
    0  502                            29         28
  273  2699      FMT                  63         62
  306  2700      FMT                  65         64
  117  3699                           35         42
  123  3700                           36         54
  161  3701                           43         35         56
  176  3702                           49         34
  170  3703                           47         49
  202  3704                           50         58
  213  3705                           55         37
  217  3706                           57         48
  223  3707                           59         55         57

LOOPS  LABEL     INDEX       FROM-TO     LENGTH     PROPERTIES
   23  101       I             10 11         48      INSTACK
   71  502       J             28 29         78      INSTACK

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       DOBK           4                 0 IOO      (1)                  1 ITY     (1)                  2 DUM     (1)
                                        3 UT       (1)
       NDXRF         35                 0 INDXRF  (35)
       PRVNT1         1                 0 ISKIP    (1)
       SCAN3          1                 0 JDL      (1)
       T1BK           1                 0 T1       (1)

STATISTICS
   PROGRAM LENGTH                  366B      246
   CM LABELED COMMON LENGTH         52B       42
```

```
      SUBROUTINE RIGID(XREPAIR,XSLJNT,XRESLAB,XCLEAN,XDISTOT,XTOTAL,KK,
     *TRKK,      ISTART,IEND,TMO)
      DIMENSION  REPFL(10,2),REPRG(10,2)
      DIMENSION TOTAL(35)
      DIMENSION          PERCENT(25) ,TMO(10,4) ,INDXRF(35)
      COMMON /ARBK/ AREA
      COMMON /DMBLK/ TRST
      COMMON /NDXRF/ INDXRF
      COMMON /PRVNT/ICYCLE,FACTR1,FACTR2,FACTR3,FRSTSL,COSTR,NRG,REPRG,
     * IRG,  CRSL,PTCH,CLNDRN,JCYCLE,CLNSWP,SLCT,COSTF,NFL,REPFL,IFL
     * ,SCLPOP
      COMMON /SCAN3/ JDL
      COMMON /TTL/TOTAL
      DATA (PERCENT(I),I=1,25)/0,0,0,.04,0,.13,0,.28,0, .31, 0, .51,
     $ 0, .99, 0, 1.16, 0, 1.41, 0, 1.21, 0, .88, 0, .41, 0 /
      KS=1
      KK=1
      ISTRT=ISTART
      DO 7803 NA=ISTART,IEND
      IF(INDXRF(NA).NE.3) TRKK=TRKK+TMO(KK,2)
      IF(INDXRF(NA).NE.3) KK=KK+1
      IF(INDXRF(NA).NE.3)  ISTRT=NA
      NB=NA-ISTRT+1
      NC=NB-4
      REPAIR=0.
      IF(NC.GE.0) REPAIR=SCLPOP*(1.+NC/22.)*AREA
      SLJNT=0
      IFACT=NB/ICYCLE
      IF(NB.EQ.(IFACT*ICYCLE)) SLJNT=AREA *FACTR1
      RESLAB=FACTR3*TRKK*AREA*PERCENT(NB)*.01
      CLEAN=FACTR2*NB*AREA
      XREPAIR=XREPAIR+REPAIR
      XSLJNT=XSLJNT+SLJNT
      XRESLAB=XRESLAB+RESLAB
      XCLEAN=XCLEAN+CLEAN
      TOTAL(NA)=REPAIR+SLJNT+RESLAB+CLEAN
      DRAINS=0.
      IF(NB.EQ.(NB/JCYCLE)*JCYCLE)DRAINS=CLNDRN*AREA
      IF (JDL-NA.LE.JCYCLE/2) DRAINS=0.
      RIGMAN=0.
      IF(NB.EQ.(NB/NRG)*NRG)RIGMAN=COSTR*AREA
      RIGPAR=0.
      IF(KS.GT.IRG) GOTO 1900
      KREP=INT(REPRG(KS,1)+.001)
      IF (KREP.EQ.NB) RIGPAR=REPRG(KS,2)
      IF (KREP.EQ.NB) KS=KS+1
 1900 CONTINUE
      TOTAL(NA)=TOTAL(NA)+DRAINS+RIGMAN+RIGPAR
      XTOTAL=XTOTAL+TOTAL(NA)
      DISTOT=TOTAL(NA)/(1.+TRST)**NA
      XDISTOT=XDISTOT+DISTOT
 7803 CONTINUE
      RETURN
      END
```

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       SUBROUTINE RIGID      74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE     2

       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  RIGID            1          53

VARIABLES        SN  TYPE                RELOCATION
    0  AREA      REAL                 ARBK       REFS         6        26        29        30        31        38        41
  251  CLEAN     REAL                            REFS        35        36   DEFINED        31
   36  CLNDRN    REAL                PRVNT       REFS         9        38
   40  CLNSWP    REAL                PRVNT       REFS         9
   42  COSTF     REAL                PRVNT       REFS         9
    5  COSTR     REAL                PRVNT       REFS         9        41
   34  CRSL      REAL                PRVNT       REFS         9
  256  DISTOT    REAL                            REFS        51   DEFINED        50
  252  DRAINS    REAL                            REFS        48   DEFINED        37        38        39
    1  FACTR1    REAL                PRVNT       REFS         9        29
    2  FACTR2    REAL                PRVNT       REFS         9        31
    3  FACTR3    REAL                PRVNT       REFS         9        30
    4  FRSTSL    REAL                PRVNT       REFS         9
    0  ICYCLE    INTEGER             PRVNT       REFS         9        28        29
    0  IEND      INTEGER              F.P.       REFS        19   DEFINED         1
  247  IFACT     INTEGER                         REFS        29   DEFINED        28
   70  IFL       INTEGER             PRVNT       REFS         9
    0  INDXRF    INTEGER   ARRAY     NDXRF       REFS         5         8        20        21        22
   33  IRG       INTEGER             PRVNT       REFS         9        43
    0  ISTART    INTEGER              F.P.       REFS        18        19   DEFINED         1
  241  ISTRT     INTEGER                         REFS        23   DEFINED        18        22
   37  JCYCLE    INTEGER             PRVNT       REFS         9      2*38        39
    0  JDL       INTEGER             SCAN3       REFS        12        39
    0  KK        INTEGER              F.P.       REFS        20        21   DEFINED         1        17        21
  255  KREP      INTEGER                         REFS        45        46   DEFINED        44
  240  KS        INTEGER                         REFS        43        44        45        46   DEFINED        16        46
  242  NA        INTEGER                         REFS        20        21      2*22        23        36        39      2*48
                                                   49      2*50   DEFINED        19
  243  NB        INTEGER                         REFS        24        28        29        30        31      2*38      2*41
                                                   45        46   DEFINED        23
  244  NC        INTEGER                         REFS      2*26   DEFINED        24
   43  NFL       INTEGER             PRVNT       REFS         9
    6  NRG       INTEGER             PRVNT       REFS         9      2*41
  257  PERCENT   REAL      ARRAY                 REFS         5        30   DEFINED        14
   35  PTCH      REAL                PRVNT       REFS         9
  245  REPAIR    REAL                            REFS        32        36   DEFINED        25        26
   44  REPFL     REAL      ARRAY     PRVNT       REFS         3         9
    7  REPRG     REAL      ARRAY     PRVNT       REFS         3         9        44        45
  250  RESLAB    REAL                            REFS        34        36   DEFINED        30
  253  RIGMAN    REAL                            REFS        48   DEFINED        40        41
  254  RIGPAR    REAL                            REFS        48   DEFINED        42        45
   71  SCLPOP    REAL                PRVNT       REFS         9        26
   41  SLCT      REAL                PRVNT       REFS         9
  246  SLJNT     REAL                            REFS        33        36   DEFINED        27        29
    0  TMO       REAL      ARRAY      F.P.       REFS         5        20   DEFINED         1
    0  TOTAL     REAL      ARRAY       TTL       REFS         4        13        48        49        50
                                              DEFINED        36        48
    0  TRKK      REAL                 F.P.       REFS        20        30   DEFINED         1        20
    0  TRST      REAL                DMBLK       REFS         7        50
    0  XCLEAN    REAL                 F.P.       REFS        35   DEFINED         1        35
    SUBROUTINE RIGID      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00         PAGE     3

VARIABLES    SN  TYPE            RELOCATION
    0  XDISTOT   REAL                 F.P.        REFS       51   DEFINED        1       51
    0  XREPAIR   REAL                 F.P.        REFS       32   DEFINED        1       32
    0  XRESLAB   REAL                 F.P.        REFS       34   DEFINED        1       34
    0  XSLJNT    REAL                 F.P.        REFS       33   DEFINED        1       33
    0  XTOTAL    REAL                 F.P.        REFS       49   DEFINED        1       49

INLINE FUNCTIONS    TYPE    ARGS        DEF LINE  REFERENCES
       INT        INTEGER    1  INTRIN                 44

STATEMENT LABELS                DEF LINE   REFERENCES
  201  1900                        47         43
    0  7803                        52         19

LOOPS  LABEL    INDEX      FROM-TO    LENGTH    PROPERTIES
  26   7803   * NA          19 52      177B                 EXT REFS

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       ARBK          1                0 AREA    (1)
       OMBLK         1                0 TRST    (1)
       NDXRF        35                0 INDXRF  (35)
       PRVNT        58                0 ICYCLE  (1)                  1 FACTR1  (1)                  2 FACTR2  (1)
                                      3 FACTR3  (1)                  4 FRSTSL  (1)                  5 COSTR   (1)
                                      6 NRG     (1)                  7 REPRG   (20)                27 IRG     (1)
                                     28 CRSL    (1)                 29 PTCH    (1)                 30 CLNORN  (1)
                                     31 JCYCLE  (1)                 32 CLNSWP  (1)                 33 SLCT    (1)
                                     34 COSTF   (1)                 35 NFL     (1)                 36 REPFL   (20)
                                     56 IFL     (1)                 57 SCLPOP  (1)
       SCAN3         1                0 JDL     (1)
       TTL          35                0 TOTAL   (35)

STATISTICS
  PROGRAM LENGTH                 340B     224
  CM LABELED COMMON LENGTH       203B     131
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```
SUBROUTINE FLEXBL      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00         PAGE     1

           SUBROUTINE FLEXBL(TTSLCT,TTCRPT,TCLNDRN,TCLNSWP,TTOT,TDTOT,
          *            ISTART,IEND)
           REAL LDBR
           DIMENSION  REPFL(10,2),REPRG(10,2)
           DIMENSION TOTAL(35)
           DIMENSION SLCOAT(35),CRKPTCH(35)
           INTEGER  FRSTSL,SEALYR(15) ,INDXRF(35)
           DIMENSION    CCLNDRN(35),CCLNSWP(35)
           COMMON /ARBK/ AREA
           COMMON /DMBLK/ TRST
           COMMON /DOBK/ IDQ,ITY
           COMMON /NDXRF/ INDXRF
           COMMON /PRVNT/ICYCLE,FACTR1,FACTR2,FACTR3,FRSTSL,COSTR,NRG,REPRG,
          * IRG,  CRSL,PTCH,CLNDRN,JCYCLE,CLNSWP,SLCT,COSTF,NFL,REPFL,IFL
          * ,SCLPOP
           COMMON /RESTR/IREST,JREST,ICOUNT
           COMMON /SCAN3/ JDL
           COMMON /TTL/TOTAL
           COMMON /TYPBK/ LMH,LFUNC
           JS=1
           LDBR=5.92
           UNLDBR=3.65
           IJ=0
           ISTRT=ISTART
           JYR=ISTART-1
           IF (ISTART.NE.1) GOTO 16
           IF((ITY.EQ.1).OR.(IREST.EQ.2)) JYR=100
           IF(ITY.EQ.2)IJ=1
           IF(ITY.EQ.2)SEALYR(1)=FRSTSL
        16 INDXRF(JDL)=2
           I=ISTART-1
        17 I=I+1
        18 IYR=I
           IF (INDXRF(I).NE.3) JYR=I
           IF((IYR-JYR).GE.8)IJ=IJ+1
           IF((IYR-JYR).GE.8)SEALYR(IJ)=JYR+5
           IF((IYR-JYR).GE.8) I=JYR+5
           IF((IYR-JYR).GE.8) JYR=I
       302 SLCOAT(I)=0
           IF(I.LE.IEND) GOTO 17
            IF(IJ.LT.1) GOTO 1702
           DO 151 I=1,IJ
       151 SLCOAT(SEALYR(I))=SLCT   *AREA
      1702 DO 1701 I=ISTART,IEND
           IF(INDXRF(I).NE.3)ISTRT=I
           IF(LFUNC.LE.4) CRKPTCH(I)=CRSL*AREA
           IF(LFUNC.EQ.5) CRKPTCH(I)=UNLDBR*AREA
           TTSLCT=TTSLCT+SLCOAT(I)
           TTCRPT=TTCRPT+CRKPTCH(I)
           CCLNDRN(I)=0
           L=I-ISTRT+1
           IF(L.EQ.(L/JCYCLE)*JCYCLE) CCLNDRN(I)=CLNDRN*AREA
           IF(JDL-(L/JCYCLE)*JCYCLE.LE.JCYCLE/2)CCLNDRN(I)=0.
           TCLNDRN=TCLNDRN+CCLNDRN(I)
           CCLNSWP(I)=CLNSWP*AREA*L
           TCLNSWP=TCLNSWP+CCLNSWP(I)
           FLXPAR=0
```

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     SUBROUTINE FLEXBL     74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     2

                                FLXMAN=0.
                                IF(L.EQ.(L/NFL)*NFL) FLXMAN=COSTF*AREA
     60                         IF(JS.GT.IFL) GO TO 1900
                                IF(INT(REPFL(JS,1)+.001).EQ.L) FLXPAR=REPFL(JS,2)
                                IF(INT(REPFL(JS,1)+.001).EQ.L) JS=JS+1
                          1900   CONTINUE
                                PATCH=PTCH*AREA
     65                         TOT=SLCOAT(I)+CRKPTCH(I)+CCLNDRN(I)+CCLNSWP(I) +PATCH
                                TOT=TOT+FLXMAN+FLXPAR
                                TOTAL(I)=TOT
                                TTOT=TTOT+TOT
                                DTOT=TOT/((1.+TRST)**I)
     70                         TDTOT=TDTOT+DTOT
                          1701  CONTINUE
                                RETURN
                                END


     SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     4  FLEXBL         1           72

 VARIABLES       SN   TYPE              RELOCATION
     0  AREA          REAL                   ARBK       REFS         9        43        46        47        52        55        59
                                                          64
   470  CCLNDRN       REAL         ARRAY                REFS         8        54        65   DEFINED        50        52        53
   533  CCLNSWP       REAL         ARRAY                REFS         8        56        65   DEFINED        55
    36  CLNDRN        REAL                   PRVNT      REFS        13        52
    40  CLNSWP        REAL                   PRVNT      REFS        13        55
    42  COSTF         REAL                   PRVNT      REFS        13        59
     5  COSTR         REAL                   PRVNT      REFS        13
   406  CRKPTCH       REAL         ARRAY                REFS         6        49        65   DEFINED        46        47
    34  CRSL          REAL                   PRVNT      REFS        13        46
   342  DTOT          REAL                              REFS        70   DEFINED        69
     1  FACTR1        REAL                   PRVNT      REFS        13
     2  FACTR2        REAL                   PRVNT      REFS        13
     3  FACTR3        REAL                   PRVNT      REFS        13
   337  FLXMAN        REAL                              REFS        66   DEFINED        58        59
   336  FLXPAR        REAL                              REFS        66   DEFINED        57        61
     4  FRSTSL        INTEGER                PRVNT      REFS         7        13        29
   333  I             INTEGER                           REFS        32        33      2*34        38        39        40        43
                                                         2*45       46        47        48        49        50        51        52
                                                           53       54        55        56      4*65        67        69
                                                      DEFINED       31        32        37        42        44
     2  ICOUNT        INTEGER                RESTR      REFS        16
     0  ICYCLE        INTEGER                PRVNT      REFS        13
     0  IDQ           INTEGER                DOBK       REFS        11
     0  IEND          INTEGER                F.P.       REFS        40        44   DEFINED         1
    70  IFL           INTEGER                PRVNT      REFS        13        60
   330  IJ            INTEGER                           REFS        35        36        41        42   DEFINED        23        28
                                                          35
     0  INDXRF        INTEGER      ARRAY     NDXRF      REFS         7        12        34        45   DEFINED        30
     0  IREST         INTEGER                RESTR      REFS        16        27
```

```
      SUBROUTINE FLEXBL      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE     3

VARIABLES      SN  TYPE             RELOCATION
    33  IRG        INTEGER                PRVNT        REFS        13
     0  ISTART     INTEGER                 F.P.        REFS        24         25         26         31         44
                                                    DEFINED         1
   331  ISTRT      INTEGER                             REFS        51    DEFINED         24         45
     1  ITY        INTEGER                DOBK         REFS        11         27         28         29
   334  IYR        INTEGER                             REFS        35         36         37         38    DEFINED         33
    37  JCYCLE     INTEGER                PRVNT        REFS        13       2*52       3*53
     0  JDL        INTEGER                SCAN3        REFS        17         30         53
     1  JREST      INTEGER                RESTR        REFS        16
   326  JS         INTEGER                             REFS        60       2*61       2*62    DEFINED         20         62
   332  JYR        INTEGER                             REFS        35       2*36       2*37         38    DEFINED         25         27
                                                         34        38
   335  L          INTEGER                             REFS      2*52         53         55       2*59         61         62
                                                    DEFINED        51
   325  LDBR       REAL                                REFS         3    DEFINED         21
     1  LFUNC      INTEGER                TYPBK        REFS        19         46         47
     0  LMH        INTEGER                TYPBK        REFS        19
    43  NFL        INTEGER                PRVNT        REFS        13       2*59
     6  NRG        INTEGER                PRVNT        REFS        13
   340  PATCH      REAL                                REFS        65    DEFINED         64
    35  PTCH       REAL                   PRVNT        REFS        13         64
    44  REPFL      REAL          ARRAY    PRVNT        REFS         4         13       2*61         62
     7  REPRG      REAL          ARRAY    PRVNT        REFS         4         13
    71  SCLPOP     REAL                   PRVNT        REFS        13
   451  SEALYR     INTEGER       ARRAY                 REFS         7         43    DEFINED         29         36
   343  SLCOAT     REAL          ARRAY                 REFS         6         48         65    DEFINED         39         43
    41  SLCT       REAL                   PRVNT        REFS        13         43
     0  TCLNDRN    REAL                    F.P.        REFS        54    DEFINED          1         54
     0  TCLNSWP    REAL                    F.P.        REFS        56    DEFINED          1         56
     0  TDTOT      REAL                    F.P.        REFS        70    DEFINED          1         70
   341  TOT        REAL                                REFS        66         67         68         69    DEFINED         65         66
     0  TOTAL      REAL          ARRAY    TTL          REFS         5         18    DEFINED         67
     0  TRST       REAL                   DMBLK        REFS        10         69
     0  TTCRPT     REAL                    F.P.        REFS        49    DEFINED          1         49
     0  TTOT       REAL                    F.P.        REFS        68    DEFINED          1         68
     0  TTSLCT     REAL                    F.P.        REFS        48    DEFINED          1         48
   327  UNLDBR     REAL                                REFS        47    DEFINED         22

INLINE FUNCTIONS   TYPE    ARGS         DEF LINE  REFERENCES
        INT        INTEGER    1  INTRIN                61        62

STATEMENT LABELS                 DEF LINE   REFERENCES
    55  16                          30         26
    63  17                          32         40
     0  18          INACTIVE        33
     0  151                         43         42
     0  302         INACTIVE        39
     0  1701                        71         44
   137  1702                        44         41
   254  1900                        63         60

LOOPS  LABEL    INDEX      FROM-TO     LENGTH     PROPERTIES
   130  151      I          42 43         68       INSTACK
   141  1701   * I          44 71       1528                   EXT REFS
```

```
      SUBROUTINE FLEXBL      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00         PAGE      4

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       ARBK          1                  0 AREA    (1)
       DMBLK         1                  0 TRST    (1)
       DOBK          2                  0 IDQ     (1)                 1 ITY     (1)
       NDXRF        35                  0 INDXRF  (35)
       PRVNT        58                  0 ICYCLE  (1)                 1 FACTR1  (1)                 2 FACTR2  (1)
                                        3 FACTR3  (1)                 4 FRSTSL  (1)                 5 COSTR   (1)
                                        6 NRG     (1)                 7 REPRG   (20)               27 IRG     (1)
                                       28 CRSL    (1)                29 PTCH    (1)                30 CLNDRN  (1)
                                       31 JCYCLE  (1)                32 CLNSWP  (1)                33 SLCT    (1)
                                       34 COSTF   (1)                35 NFL     (1)                36 REPFL   (20)
                                       56 IFL     (1)                57 SCLPOP  (1)
       RESTR         3                  0 IREST   (1)                 1 JREST   (1)                 2 ICOUNT  (1)
       SCAN3         1                  0 JDL     (1)
       TTL          35                  0 TOTAL   (35)
       TYPBK         2                  0 LMH     (1)                 1 LFUNC   (1)

STATISTICS
  PROGRAM LENGTH                  616B      398
  CM LABELED COMMON LENGTH        212B      138
```

```
SUBROUTINE RDO        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00          PAGE      1

            SUBROUTINE RDO(TN,TL,OTH)
            DIMENSION CV(20)
            DIMENSION DUMBGD(10,20)
            REAL DUM(20)
            COMMON /BMBLK/ TRA(20),TRAA(20)
            COMMON /EMBLK/ FAIL2(10,10)
            COMMON /HBLK/ HH(10),TM(20),AHH(10)
            COMMON /LCY/ AXK,YKQ,TRYQ(20),FACQ,LS
            COMMON/LTTBLK/LTT(10),IAA(10)
            COMMON /MIXBLK/ STOR1Q(10,10),STOR2Q(10,10),COVRGD(10,20),IMIX
            COMMON /NBLK/ NOGQ,NOH,NPTQ,NXQ,NYQ,NODQ,NOSGQ,XK
            COMMON /RODLOD/ IDR,LZ,IDF
            COMMON /SCAN3/ JDL
       1000 FORMAT(2X,10F6.0)
            WRITE(6,1000) (AHH(K),K=1,NOH)
            WRITE(6,1000) ((FAIL2(K,L),L=1,NOH),K=1,IMIX)
            DO 4 I=1,IMIX
            DO 1 J=1,LS
            CV(J)=COVRGD(I,J)
            IF(IAA(I).EQ.2) CV(J)=COVRGD(I,J)/2.
          1 CONTINUE
            KK=LS
            CALL GINT(CV,TM,TL,CVV,KK,20)
            DO 4 J=1,LS
            DUMBGD(I,J)=COVRGD(I,J)-CVV
            IF(DUMBGD(I,J)) 2,2,3
          2 DUMBGD(I,J)=1.
          3 CONTINUE
          4 CONTINUE
            WRITE(6,1000) ((COVRGD(K,L),L=1,LS),K=1,IMIX)
            DO 5 I=1,NOH
            AHH(I)=(AHH(I)**2)
          5 CONTINUE
            WRITE(6,1000) ((DUMBGD(K,L),L=1,LS),K=1,IMIX)
            IF(LZ.EQ.3) GO TO 19
            CALL MIXED (DUMBGD,FAIL2,NOH,AHH,TRAA,TRA,IMIX,LS)
            GO TO 18
         19 CONTINUE
            DO 10 I=1,LS
         10    DUM(I)=DUMBGD(1,I)
            CALL RODTHK(DUM    ,LS,TRAA)
            DO 11 I=1,LS
         11 TRAA(I)=(TRAA(I)**2)*AHH(1)
         18 CONTINUE
            KK=LS
            CALL GINT(TRAA,TM,TN,OTH,KK,20)
            OTH=SQRT(OTH)
            DO 6 I=1,NOH
            AHH(I)=SQRT(AHH(I))
          6 CONTINUE
            OTH=AINT(OTH+.1)
            RETURN
            END
```

```
           SUBROUTINE RDO        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00          PAGE     2

           SYMBOLIC REFERENCE MAP (R=3)

       ENTRY POINTS      DEF LINE      REFERENCES
           4  RDO              1           52

       VARIABLES       SN  TYPE               RELOCATION
          36  AHH          REAL        ARRAY   HBLK          REFS          7         15         32         36         43         49
                                                          DEFINED         32         49
           0  AXK          REAL                LCY           REFS          8
         310  COVRGD       REAL        ARRAY   MIXBLK        REFS         10         19         20         25         30
         366  CV           REAL        ARRAY                 REFS          2         23    DEFINED         19         20
         365  CVV          REAL                              REFS         23         25
         722  DUM          REAL        ARRAY                 REFS          4         41    DEFINED         40
         412  DUMBGD       REAL        ARRAY                 REFS          3         26         34         36         40
                                                          DEFINED         25         27
          26  FACQ         REAL                LCY           REFS          8
           0  FAIL2        REAL        ARRAY   EMBLK         REFS          6         16         36
           0  HH           REAL        ARRAY   HBLK          REFS          7
         362  I            INTEGER                           REFS         19       2*20       2*25         26         27       2*32       2*40
                                                                    2*43       2*49    DEFINED         17         31         39         42         48
          12  IAA          INTEGER     ARRAY   LTTBLK        REFS          9         20
           2  IDF          INTEGER             RODLOD        REFS         12
           0  IDR          INTEGER             RODLOD        REFS         12
         620  IMIX         INTEGER             MIXBLK        REFS         10         16         17         30         34         36
         363  J            INTEGER                           REFS       2*19       2*20       2*25         26         27
                                                          DEFINED         18         24
           0  JDL          INTEGER             SCAN3         REFS         13
         360  K            INTEGER                           REFS         15         16         30         34    DEFINED         15         16
                                                                      30         34
         364  KK           INTEGER                           REFS         23         46    DEFINED         22         45
         361  L            INTEGER                           REFS         16         30         34    DEFINED         16         30         34
          27  LS           INTEGER             LCY           REFS          8         18         22         24         30         34         36
                                                                      39         41         42         45
           0  LTT          INTEGER     ARRAY   LTTBLK        REFS          9
           1  L7           INTEGER             RODLOD        REFS         12         35
           5  NODQ         INTEGER             NBLK          REFS         11
           0  NOGQ         INTEGER             NBLK          REFS         11
           1  NOH          INTEGER             NBLK          REFS         11         15         16         31         36         48
           6  NOSGQ        INTEGER             NBLK          REFS         11
           2  NPTQ         INTEGER             NBLK          REFS         11
           3  NXQ          INTEGER             NBLK          REFS         11
           4  NYQ          INTEGER             NBLK          REFS         11
           0  OTH          REAL                F.P.          REFS         46         47         51    DEFINED          1         47         51
           0  STOR1Q       REAL        ARRAY   MIXBLK        REFS         10
         144  STOR2Q       REAL        ARRAY   MIXBLK        REFS         10
           0  TL           REAL                F.P.          REFS         23    DEFINED          1
          12  TM           REAL        ARRAY   HBLK          REFS          7         23         46
           0  TN           REAL                F.P.          REFS         46    DEFINED          1
           0  TRA          REAL        ARRAY   BMBLK         REFS          5         36
          24  TRAA         REAL        ARRAY   BMBLK         REFS          5         36         41         43         46
                                                          DEFINED         43
           2  TRYQ         REAL        ARRAY   LCY           REFS          8
           7  XK           REAL                NBLK          REFS         11
           1  YKQ          REAL                LCY           REFS          8
       SUBROUTINE RDO        74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77   13.54.00       PAGE     3

FILE NAMES        MODE
       TAPE6     FMT                   WRITES       15        16        30        34

EXTERNALS          TYPE   ARGS       REFERENCES
       GINT                 6             23        46
       MIXED                8             36
       RODTHK               3             41
       SQRT      REAL       1 LIBRARY     47        49

INLINE FUNCTIONS   TYPE   ARGS       DEF LINE  REFERENCES
       AINT      REAL       1  INTRIN               51

STATEMENT LABELS             DEF LINE   REFERENCES
    0  1                        21        18
    0  2          INACTIVE      27      2*26
  117  3                        28        26
    0  4                        29        17        24
    0  5                        33        31
    0  6                        50        48
    0  10                       40        39
    0  11                       43        42
  231  18                       44        37
  207  19                       38        35
  323  1000   FMT               14        15        16        30        34

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   27         * K           16 16       15B              EXT REFS  NOT INNER
   30         * L           16 16       11B              EXT REFS
   50  4      * I           17 29       55B              EXT REFS  NOT INNER
   52  1        J           18 21       17B        OPT
  100  4        J           24 29       22B        OPT
  130         * K           30 30       15B              EXT REFS  NOT INNER
  131         * L           30 30       11B              EXT REFS
  151  5        I           31 33        5B     INSTACK
  161         * K           34 34       15B              EXT REFS  NOT INNER
  162         * L           34 34       11B              EXT REFS
  211  10       I           39 40        6B     INSTACK
  223  11       I           42 43        5B     INSTACK
  246  6      * I           48 50       10B              EXT REFS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       AMBLK        40              0 TRA     (20)                20 TRAA    (20)
       EMBLK       100              0 FAIL2   (100)
       HBLK         40              0 HH      (10)                10 TM      (20)                30 AHH     (10)
       LCY          24              0 AXK     (1)                  1 YKQ     (1)                  2 TRYQ    (20)
                                   22 FACQ    (1)                 23 LS      (1)
       LTTBLK       20              0 LTT     (10)                10 IAA     (10)
       MIXBLK      401              0 STOR1Q  (100)              100 STOR2Q  (100)              200 COVRGD  (200)
                                  400 IMIX    (1)
       NBLK          8              0 NOGQ    (1)                  1 NOH     (1)                  2 NPTQ    (1)
                                    3 NXQ     (1)                  4 NYQ     (1)                  5 NODQ    (1)
                                    6 NOSGQ   (1)                  7 XK      (1)
       RODLOD        3              0 IOR     (1)                  1 LZ      (1)                  2 IDF     (1)
       SCAN3         1              0 JDL     (1)
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      SUBROUTINE RDO          74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

   STATISTICS
     PROGRAM LENGTH                 754B      492
     CM LABELED COMMON LENGTH      1175B      637
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```
      SUBROUTINE MOAC(TMO.STRT.NSTRT.COM)
      DIMENSION STRT(10),TMO(10.4)
      COMMON /ARBK/ AREA
      COMMON /COUNT/ICONT
      COMMON /DMBLK/ TRST
      COMMON /DOBK/ IDQ.ITY
      COMMON /HBLK/ HHQ(10),TM(20)
      COMMON /LCY/ AXKQ.YKQ,TRYQ(20).FACQ.LS
      COMMON /LYTD/ NNAT.YCBR(10.4),NCOM,ZCBR(10,6),NSBB.XMT(10.6),
     1NB,ZMT(3.4)
      COMMON /PRVNT1/ ISKIP.JISKIP
      COMMON /RL1/ K7.K4.EARTHWK.IDENT(3),FACTOR
      COMMON /RODLOD/ IDR.LZ.IDF
      COMMON /SCAN3/ JDL
      COMMON /TYPBK/ LMH.LFUNC
      ICONT=ICONT+1
      ITDR=JDL
      CTOV=0.
      CR=0.
      COM=0.
      J=0
      K=0
      DO 1 I=1.ITDR
      M=J+1
      CTOV1=0.
      SIC=10000000.
      IF(M.GT.NSTRT) GO TO 12
      L=INT(STRT(M)+.1)
      IF(I.EQ.L) GO TO 5
      K=K+1
      GO TO 6
    5 J=J+1
      KKEEP=K+1
      K=0
    6 CONTINUE
      IF(I.NE.L) GO TO 12
      IB=INT(TMO(M.3)+.1)
      ITYP=INT(TMO(M.1)+.1)
      IF(ITYP.EQ.2) NNN=7
      IF(ITYP.NE.1) GO TO 11
      IF(IB.EQ.2) NNN=5
      IF(IB.EQ.3) NNN=6
      IF(M.EQ.1) JTYPE=ITY
      IF(M.GT.1) JTYPE=INT(TMO(M-1.1)+.1)
      IF(JTYPE.EQ.2)NNN=1
   11 CONTINUE
      THK=TMO(M.2)
      IF(ITYP.EQ.1) GO TO 13
      IBASE=1
      IPRQ=1
      ISB=2
      LJ=0
      DO 14 LK=1.NB
      IF(ZMT(LK.1).GT.90.) LJ=LK
   14 CONTINUE
      IF(LJ.GT.0) GO TO 15
      TLM=THK
      WRITE(6.1000)
 1000 FORMAT(2X." IF BASE MATERIAL IS TO BE USED IN FLEXIBLE OVERLAYS "/
     12X." IT MUST HAVE A CBR OF A 100.  NO SUCH MATERIAL WAS GIVEN")
      GO TO 16
 15   IF(L7.EQ.3) GO TO 21
      CALL TLMM(LMH,LFUNC,IBASE.ISB.IPBQ,TLIM)
      GO TO 22
 21   CBR=100.
      CALL MTHICK(IDF,CBR,TLIM,LFUNC,BASET)
 22   TUU=TLIM+4.
      IF(THK.LT.TUU) GO TO 16
      TKH=THK-TLIM
      MMM=NCOM+NSBR+LJ+7
      CALL SERCST(MMM,TKH,SIC)
      TLM=TLIM
 16   CONTINUE
      IF(SIC.GT.1000000.) GO TO 13
      CTOV1=SIC*AREA
      THK=TLM
      TMO(M,2)=TMO(M,2)+.01*(TMO(M,2)-TLM)
 13   CONTINUE
      CALL SERCST(NNN,THK,SYC)
      CTOV=SYC*AREA
      IF(CTOV1.GT.0.) CTOV=CTOV+CTOV1
 12   CONTINUE
      IF(M.GT.NSTRT) K=K+1
      TN=FLOAT(K)
      IF(K.EQ.0) TN=FLOAT(KKEEP)
      IF(M.GT.1) GO TO 100
      IF(JISKIP.NE.1) GO TO 300
      IF(ITY.EQ.1) NNN=NCOM+NSBB+NB+8
      IF(ITY.EQ.2) NNN=NCOM+NSBB+NB+11
      GO TO 200
 100  IF(JISKIP.NE.1) GO TO 300
      LL=INT(TMO(J,1)+.1)
      NNN=(LL**2)+NCOM+NSBB+NB+8
 200  CONTINUE
      CALL SERCST(NNN,TN,SYC)
      CR=SYC*AREA
 300  CTOT=CTOV+CR
      CR=0.
      CTOV=0.
      CTOT=CTOT/((1.+TRST)**I)
      COM=COM+CTOT
   1  CONTINUE
      MM=ICONT
      CALL PREVENT(TMO,STRT,NSTRT,DTOTAL,MM)
      COM=COM+DTOTAL
      COM=COM*FACTOR
      RETURN
      END
      SUBROUTINE MOAC       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     3

      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS        DEF LINE       REFERENCES
    4  MOAC             1            107

VARIABLES       SN  TYPE                RELOCATION
    0  AREA         REAL                 ARRK         REFS         3        75        80        96
    0  AXKQ         REAL                 LCY          REFS         8
  531  RASET      * REAL                              REFS        66
  530  CBR          REAL                              REFS        66   DEFINED        65
    0  COM          REAL                  F.P.        REFS       101       105       106   DEFINED         1        20       101
                                                       105       106
  503  CR           REAL                              REFS        97   DEFINED        19        96        98
  540  CTOT         REAL                              REFS       100       101   DEFINED        97       100
  502  CTOV         REAL                              REFS        81        97   DEFINED        18        80        81        99
  510  CTOVI        REAL                              REFS      2*81   DEFINED        25        75
  542  QTOTAL       REAL                              REFS       104       105
    2  EARTHWK      REAL                 RL1          REFS        12
   26  FACQ         REAL                 LCY          REFS         8
    6  FACTOR       REAL                 RL1          REFS        12       106
    0  HHQ          REAL        ARRAY    HBLK         REFS         7
  505  I            INTEGER                           REFS        29        36       100   DEFINED        23
  514  IB           INTEGER                           REFS        41        42   DEFINED        37
  521  IBASE        INTEGER                           REFS        63   DEFINED        49
    0  ICONT        INTEGER              COUNT        REFS         4        16       103   DEFINED        16
    3  IDENT        INTEGER     ARRAY    RL1          REFS        12
    2  IDF          INTEGER              RODLOD       REFS        13        66
    0  IDQ          INTEGER              DOBK         REFS         6
    0  IDR          INTEGER              RODLOD       REFS        13
  522  IPBQ         INTEGER                           REFS        63   DEFINED        50
  523  ISB          INTEGER                           REFS        63   DEFINED        51
    0  ISKIP        INTEGER              PRVNT1       REFS        11
  501  ITDR         INTEGER                           REFS        23   DEFINED        17
    1  ITY          INTEGER              DOBK         REFS         6        43        88        89
  515  ITYP         INTEGER                           REFS        39        40        48   DEFINED        38
  504  J            INTEGER                           REFS        24        32        92   DEFINED        21        32
    0  JDL          INTEGER              SCAN3        REFS        14        17
    1  JISKIP       INTEGER              PRVNT1       REFS        11        87        91
  517  JTYPE        INTEGER                           REFS        45   DEFINED        43        44
  505  K            INTEGER                           REFS        30        33        83        84        85
                                                   DEFINED        22        30        34        83
  513  KKEEP        INTEGER                           REFS        85   DEFINED        33
    1  K4           INTEGER              RL1          REFS        12
    0  K7           INTEGER              RL1          REFS        12
  512  L            INTEGER                           REFS        29        36   DEFINED        28
    1  LFUNC        INTEGER              TYPBK        REFS        15        63        66
  524  LJ           INTEGER                           REFS        56        70   DEFINED        52        54
  525  LK           INTEGER                           REFS      2*54   DEFINED        53
  537  LL           INTEGER                           REFS        93   DEFINED        92
    0  LMH          INTEGER              TYPBK        REFS        15        63
   27  LS           INTEGER              LCY          REFS         8
    1  LZ           INTEGER              RODLOD       REFS        13        62
  507  M            INTEGER                           REFS        27        28        37        38        43      2*44        47
                                                      3*77        83        86   DEFINED        24
  541  MM           INTEGER                           REFS       104   DEFINED       103
  534  MMM          INTEGER                           REFS        71   DEFINED        70
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       SUBROUTINE MOAC       74/74  OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     4

VARIABLES     SN  TYPE           RELOCATION
  243 NB         INTEGER            LYTD         REFS         9       53        88        89        93
   51 NCOM       INTEGER            LYTD         REFS         9       70        88        89        93
    0 NNAT       INTEGER            LYTD         REFS         9
  516 NNN        INTEGER                         REFS        79       95   DEFINED        39        41        42        45
                                                   88        89       93
  146 NSBB       INTEGER            LYTD         REFS         9       70        88        89        93
    0 NSTRT      INTEGER             F.P.        REFS        27       83       104   DEFINED         1
  511 SIC        REAL                            REFS        71       74        75   DEFINED        26
    0 STRT       REAL       ARRAY    F.P.        REFS         2       28       104   DEFINED         1
  535 SYC        REAL                            REFS        79       80        95        96
  520 THK        REAL                            REFS        57       68        69        79   DEFINED        47        76
  533 TKH        REAL                            REFS        71  DEFINED        69
  527 TLIM       REAL                            REFS        63       66        67        69        72
  526 TLM        REAL                            REFS        76       77   DEFINED        57        72
   12 TM         REAL       ARRAY   HBLK         REFS         7
    0 TMO        REAL       ARRAY    F.P.        REFS         2       37        38        44        47      2*77        92
                                                  104   DEFINED        1        77
  536 TN         REAL                            REFS        95  DEFINED        84        85
    0 TRST       REAL               DMBLK        REFS         5      100
    2 TRYQ       REAL       ARRAY   LCY          REFS         8
  532 TUU        REAL                            REFS        68  DEFINED        67
  147 XMT        REAL       ARRAY   LYTD         REFS         9
    1 YCBR       REAL       ARRAY   LYTD         REFS         9
    1 YKQ        REAL               LCY          REFS         8
   52 ZCBR       REAL       ARRAY   LYTD         REFS         9
  244 ZMT        REAL       ARRAY   LYTD         REFS         9       54

FILE NAMES        MODE
       TAPE6     FMT                  WRITES       58

EXTERNALS          TYPE   ARGS      REFERENCES
       MTHICK                 5          66
       PREVENT                5         104
       SERCST                 3          71        79        95
       TLMM                   6          63

INLINE FUNCTIONS   TYPE   ARGS       DEF LINE  REFERENCES
       FLOAT     REAL       1 INTRIN               84        85
       INT       INTEGER    1 INTRIN               28        37       38        44        92

STATEMENT LABELS            DEF LINE   REFERENCES
    0 1                        102        23
   63 5                         32        29
   73 6                         35        31
  143 11                        46        40
  265 12                        82        27        36
  253 13                        78        48        74
    0 14                        55        53
  202 15                        62        56
  236 16                        73        61        68
  210 21                        65        62
  215 22                        67        64
  323 100                       91        86
  337 200                       94        90
  345 300                       97        87        91
  453 1000    FMT               59        58
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      SUBROUTINE MOAC          74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00         PAGE     5

LOOPS  LABEL     INDEX      FROM-TO    LENGTH    PROPERTIES
   36  1       * I            23 102     330B                EXT REFS  NOT INNER
  163  14        LK           53 55        7B      INSTACK

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       ARBK           1                 0 AREA    (1)
       COUNT          1                 0 ICONT   (1)
       DMBLK          1                 0 TRST    (1)
       DOBK           2                 0 IDQ     (1)                   1 ITY     (1)
       HBLK          30                 0 HHQ     (10)                 10 TM      (20)
       LCY           24                 0 AXKQ    (1)                   1 YKQ     (1)                   2 TRYQ    (20)
                                       22 FACQ    (1)                  23 LS      (1)
       LYTD         176                 0 NNAT    (1)                   1 YCBR    (40)                 41 NCOM    (1)
                                       42 ZCBR    (60)                102 NSBB    (1)                 103 XMT     (60)
                                      163 NB      (1)                 164 ZMT     (12)
       PRVNT1         2                 0 ISKIP   (1)                   1 JISKIP  (1)
       RL1            7                 0 K7      (1)                   1 K4      (1)                   2 EARTHWK(1)
                                        3 IDENT   (3)                   6 FACTOR  (1)
       RODLOD         3                 0 IDR     (1)                   1 LZ      (1)                   2 IDF     (1)
       SCAN3          1                 0 JDL     (1)
       TYPBK          2                 0 LMH     (1)                   1 LFUNC   (1)

STATISTICS
  PROGRAM LENGTH                  561B      369
  CM LABELED COMMON LENGTH        372B      250
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```
      SUBROUTINE USRC(TMO,STRT,NSTRT,CTU)
      DIMENSION STRT(10),TMO(10,4)
      COMMON /CSTBK/ CCCST(50,10,2)
      COMMON /CUSP/ DLCF,DLCR
      COMMON /DMBLK/ TRST
      COMMON /LYTD/ NNAT,YCBR(10,4),NCOM,ZCBR(10,6),NSBB,XMT(10,6),NB
      COMMON /SCAN3/ JDL
      DLC=0.
      CAM=0.
      IF(NSTRT.EQ.0) GO TO 3
      IF(NSTRT.NE.1) GO TO 2
      ITDR=JDL
      GO TO 4
    2 ITDR=JDL
      GO TO 4
    3 ITDR=JDL
    4 CONTINUE
      CTU=0.
      J=0
      K=0
      DO 1 I=1,ITDR
      M=J+1
      IF(M.GT.NSTRT) GO TO 12
      L=INT(STRT(M)+.1)
      IF(I.EQ.L) GO TO 5
      K=K+1
      GO TO 6
    5 J=J+1
      KKEEP=K+1
      K=0
    6 CONTINUE
      IF(I.NE.L) GO TO 12
      ITYP=INT(TMO(M,1)+.1)
      IF(ITYP.EQ.1) DLC=DLCR
      IF(ITYP.EQ.2) DLC=DLCF
   12 CONTINUE
      IF(M.GT.NSTRT) K=K+1
      TN=FLOAT(K)
      IF(K.EQ.0) TN=FLOAT(KKEEP)
      NNN=NCOM+NSBB+NB+10
      MM=INT(CCCST(NNN,1,1)+.1)
      IF(MM.EQ.0) GO TO 7
      CALL SERCST(NNN,TN,SYC)
      CAM=SYC
    7 IF(MM.EQ.0) CAM=0.
      CTOT=CAM+DLC
      DLC=0.
      CAM=0.
      CTOT=CTOT/((1.+TRST)**I)
      CTU=CTU+CTOT
    1 CONTINUE
      RETURN
      END
```

```
        SUBROUTINE USRC       74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    2

        SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
   4  USRC              1          52

VARIABLES      SN  TYPE            RELOCATION
  214  CAM          REAL                              REFS       46  DEFINED        9       44       45       48
    0  CCCST        REAL         ARRAY     CSTBK      REFS        3       41
  231  CTOT         REAL                              REFS       49       50  DEFINED      46       49
    0  CTU          REAL                    F.P.      REFS       50  DEFINED        1       18       50
  213  DLC          REAL                              REFS       46  DEFINED        8       34       35       47
    0  DLCF         REAL                   CUSR       REFS        4       35
    1  DLCR         REAL                   CUSR       REFS        4       34
  220  I            INTEGER                           REFS       25       32       49  DEFINED      21
  215  ITOR         INTEGER                           REFS       21  DEFINED       12       14       16
  224  ITYP         INTEGER                           REFS       34       35  DEFINED      33
  216  J            INTEGER                           REFS       22       28  DEFINED      19       28
    0  JOL          INTEGER                SCAN3      REFS        7       12       14       16
  217  K            INTEGER                           REFS       26       29       37       38       39
                                                   DEFINED       20       26       30       37
  223  KKEEP        INTEGER                           REFS       39  DEFINED       29
  222  L            INTEGER                           REFS       25       32  DEFINED      24
  221  M            INTEGER                           REFS       23       24       33       37  DEFINED       22
  227  MM           INTEGER                           REFS       42       45  DEFINED      41
  243  NB           INTEGER                LYTD       REFS        6       40
   51  NCOM         INTEGER                LYTD       REFS        6       40
    0  NNAT         INTEGER                LYTD       REFS        6
  226  NNN          INTEGER                           REFS       41       43  DEFINED      40
  146  NSBB         INTEGER                LYTD       REFS        6       40
    0  NSTRT        INTEGER                 F.P.      REFS       10       11       23       37  DEFINED        1
    0  STRT         REAL         ARRAY      F.P.      REFS        2       24  DEFINED       1
  230  SYC          REAL                              REFS       43       44
    0  TMO          REAL         ARRAY      F.P.      REFS        2       33  DEFINED       1
  225  TN           REAL                              REFS       43  DEFINED       38       39
    0  TRST         REAL                   DMBLK      REFS        5       49
  147  XMT          REAL         ARRAY     LYTD       REFS        6
    1  YCBR         REAL         ARRAY     LYTD       REFS        6
   52  ZCBR         REAL         ARRAY     LYTD       REFS        6

EXTERNALS           TYPE   ARGS        REFERENCES
        SERCST                3            43

INLINE FUNCTIONS    TYPE   ARGS        DEF LINE   REFERENCES
        FLOAT      REAL       1  INTRIN                38        39
        INT        INTEGER    1  INTRIN                24        33       41

STATEMENT LABELS                 DEF LINE    REFERENCES
    0  1                            51          21
   33  2                            14          11
   37  3                            16          10
   42  4                            17          13        15
   73  5                            28          25
  103  6                            31          27
  154  7                            45          42
  123  12                           36          23        32
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        SUBROUTINE USRC       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE      3

  LOOPS  LABEL      INDEX       FROM-TO      LENGTH      PROPERTIES
    52   1        * I             21 51        126B                 EXT REFS

  COMMON BLOCKS    LENGTH       MEMBERS - BIAS NAME(LENGTH)
         CSTBK       1000                  0 CCCST   (1000)
         CUSR           2                  0 DLCF    (1)             1 DLCR    (1)
         DMBLK          1                  0 TRST    (1)
         LYTD         164                  0 NNAT    (1)             1 YCBR    (40)            41 NCOM    (1)
                                          42 ZCBR    (60)          102 NSBB    (1)            103 XMT     (60)
                                         163 NB      (1)
         SCAN3          1                  0 JDL     (1)

  STATISTICS
    PROGRAM LENGTH                2438      163
    CM LABELED COMMON LENGTH     22208     1168
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```
SUBROUTINE MIXED      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     1

      SUBROUTINE MIXED(C,F,N,H,T,D,IM,LS)
      DIMENSION C(10,LS),F(10,N),H(N),XMRN(20),T(20),D(20),YMRN(10)
 3000 FORMAT(" MIXED-X,AP ",2F10.2)
 3100 FORMAT(" MIXED- THICKNESSES ARE IN ERROR,MUST BE LARGER")
      X=0.0
      DO 500 I=1,LS
      T(I)=0.
      D(I)=0.
      IRN=0
      DO 405 J=1,N
      RN=0.
      DO 400 K=1,IM
      XMRN(J)=C(K,I)/F(K,J)+RN
      RN=XMRN(J)
      IF(RN.EQ.0.) IRN=IRN+1
  400 CONTINUE
      XMRN(J)=ALOG10(RN)
  405 CONTINUE
      IT=N*IM
      IF(IRN.EQ.IT)GO TO 500
      KK=N
      IF(N.LE.10)GO TO 401
      KOUNT=0
      DO10  LK=1,N
 10   IF(XMRN(LK).LT.X) KOUNT=KOUNT+1
      IF(KOUNT.EQ.N)    AP=1.
      IF(KOUNT.EQ.N)   GO TO 4
      CALL GINT(H,XMRN,X,AP,KK,20)
 4    CONTINUE
      WRITE(6,3000)X,AP
      GO TO 475
  401 CONTINUE
      DO 450 J=1,N
      YMRN(J)=XMRN(J)
  450 CONTINUE
      KOUNT=0
      DO11  LK=1,N
 11   IF(YMRN(LK).GT.X) KOUNT=KOUNT+1
      IF(KOUNT.EQ.N)WRITE(8,3100)
      IF(KOUNT.EQ.N)    STOP 3301
      CALL GINT(H,YMRN,X,AP,KK,10)
      WRITE(6,3000)X,AP
  475 CONTINUE
      T(I)=AP
      D(I)=SQRT(T(I))+.74
      D(I)=(AINT(D(I)))**2
  500 CONTINUE
      RETURN
      END


SYMBOLIC REFERENCE MAP (R=3)
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       SUBROUTINE MIXED      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE      2

ENTRY POINTS     DEF LINE     REFERENCES
    4 MIXED            1        48

VARIABLES     SN  TYPE            RELOCATION
   306 AP        REAL                             REFS        28        30        41        42        44
                                                DEFINED       26
     0 C         REAL       ARRAY     F.P.        REFS         2        13   DEFINED         1
     0 D         REAL       ARRAY     F.P.        REFS         2        46   DEFINED         1         8        45        46
     0 F         REAL       ARRAY     F.P.        REFS         2        13   DEFINED         1
     0 H         REAL       ARRAY     F.P.        REFS         2        28        41   DEFINED         1
   275 I         INTEGER                          REFS         7         8        13        44      2*45      2*46
                                                DEFINED        6
     0 IM        INTEGER              F.P.        REFS        12        19   DEFINED         1
   276 IRN       INTEGER                          REFS        15        20   DEFINED         9        15
   302 IT        INTEGER                          REFS        20   DEFINED        19
   277 J         INTEGER                          REFS      2*13        14        17      2*34   DEFINED        10        33
   301 K         INTEGER                          REFS      2*13   DEFINED        12
   303 KK        INTEGER                          REFS        28        41   DEFINED        21
   304 KOUNT     INTEGER                          REFS        25        26        27        38        39        40
                                                DEFINED       23        25        36        38
   305 LK        INTEGER                          REFS        25        38   DEFINED        24        37
     0 LS        INTEGER              F.P.        REFS         2         6   DEFINED         1
     0 N         INTEGER              F.P.        REFS       2*2        10        19        21        22        24        26
                                                    27        33        37        39        40   DEFINED         1
   300 RN        REAL                             REFS        13        15        17   DEFINED        11        14
     0 T         REAL       ARRAY     F.P.        REFS         2        45   DEFINED         1         7        44
   274 X         REAL                             REFS        25        28        30        38        41        42
                                                DEFINED        5
   307 XMRN      REAL       ARRAY                 REFS         2        14        25        28        34
                                                DEFINED       13        17
   333 YMRN      REAL       ARRAY                 REFS         2        38        41   DEFINED        34

FILE NAMES        MODE
       TAPE6     FMT                   WRITES      30        42
       TAPE8     FMT                   WRITES      39

EXTERNALS          TYPE   ARGS       REFERENCES
       ALOG10      REAL        1 LIBRARY     17
       GINT                    6             28        41
       SQRT        REAL        1 LIBRARY     45

INLINE FUNCTIONS   TYPE   ARGS       DEF LINE   REFERENCES
       AINT        REAL        1  INTRIN                 46

STATEMENT LABELS             DEF LINE   REFERENCES
   127 4                        29        27
     0 10                       25        24
     0 11                       38        37
     0 400                      16        12
   133 401                      32        22
     0 405                      18        10
     0 450                      35        33
   175 475                      43        31
   212 500                      47         6        20
   240 3000   FMT                3        30        42
   244 3100   FMT                4        39
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      SUBROUTINE MIXED       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00        PAGE     3

LOOPS  LABEL    INDEX        FROM-TO     LENGTH    PROPERTIES
   22  500     * I              6 47      173B
   32  405     * J             10 18       33B                EXT REFS  NOT INNER
   36  400       K             12 16       21B          OPT   EXT REFS  NOT INNER
  104  10        LK            24 25       10B          OPT
  135  450       J             33 35        6B       INSTACK
  147  11        LK            37 38       10B          OPT

STATISTICS
  PROGRAM LENGTH                     407B      263
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```
      SUBROUTINE BTCT(TT)
      DIMENSION THK(7).TBT(11).BT(11).STORE(10)
      DIMENSION THICK(3.10.7).AKAY(7).CVD(20).DUM(10).COV(10)
      COMMON/ABLK3/AKEFT(10).IFSWIT(10)
      COMMON /AKBLK/ AKEF(10).PAVT.BIG.TBS.AKY
      COMMON /ARBK/AREA
      COMMON/BLOCKD/PVTFLX.PVTRGD,IFLEXNA,IRIGDNA
      COMMON /BSBLK/ IBTE.FDE
      COMMON /DOM/ MNT
      COMMON /DRNBLK/DRNCST.DRAIN
      COMMON /LCY/ AXK,YK,TRY(20).FAC.LS,XCBR,XSTR
      COMMON /MIXBLK/ STORE1(10.10).STORE2(10.10).COVRGD(10.20)
      COMMON /NBLK/ NOGQ.NOHQ.NPTQ.NXQ.NYQ.NODQ.NOSGQ.XK
      COMMON /PQZ/ TRPQZ(20)
      COMMON /RL1/K7.K4.EARTHWK.IDENT(3).FACTOR
      COMMON /RODLOD/ IDR.LZ.IDF
      COMMON /THKBK/ THFF(20),TRKK(20)
      COMMON /TSV/THCK.ERCOST.PSTEP.FILPRCE.CUTPRCE,NERTH
      COMMON /TYPBK/ LMH
      INTEGER W.Z
      REAL NUM(2).TRLL(1)
      DATA(AKAY(I),I=1,7) /25..50..100..200..300..400..500./
      DATA (COV(I).I=1.5) /1..3.698970004,4..4.397940007.5./
      DATA (THICK(3.1.I).I=1.7) /21.9.20.0.18.0.16.2.14.3.12.8,10.7/
      DATA (THICK(3.2.I),I=1.7) /27.8.25.7.23.1.21.1,18.8.16.8.14.5/
      DATA (THICK(3,3,I).I=1.7)/29.0,26.8,24.3,22.1.19.6.17.5,15.1/
      DATA (THICK(3,4,I).I=1.7) /31.2.28.8.26.1.24.0.21.2.19.1,16.5/
      DATA (THICK(3.5,I).I=1.7) /33.3.30.9.28,2.25.7,23.0.20.7.18.0/
      DATA (THICK(2.1.I),I=1.7) /14.7.13.8.12.8.11.7.10.3.9.4,8.1/
      DATA (THICK(2.2.I).I=1.7) /18.4.17.2.16.1.14.7.13.2,11.9,10.4/
      DATA (THICK(2.3.I).I=1.7) /19.3.18.1.16.9.15.5.13.9.12.7.11.0/
      DATA (THICK(2,4.I).I=1.7) /20.7.19.3.18.1.16.6.14.8.13.5,11.8/
      DATA (THICK(2.5.I).I=1.7) /22.0.20.8.19.4.17.9,16.2.14.7,13.0/
 1000 FORMAT(" BTCT-EFFECTIVE K FOR INCREASED BASE ".F6.2)
 1009 FORMAT(" BTCT-AKEF.AKEFT ".10F10.2)
 1019 FORMAT(" BTCT-THIKNS ".4F10.2.2F15.0)
 2000 FORMAT(" BTCT-REVISED THICKNESS ARRAY(TRKK) "/2X,10F6.2)
 3000 FORMAT(" BTCT-BASE THK,PAVE THK,PAVE THK(TBS,PAVT,SVT)"/2X,3F6.2)
 4000 FORMAT(" BTCT-REDUCED STRENGTH K ",10F10.2)
      NERTH=0
      IF(IFSWIT(1).EQ.0) GO TO 16
      IF(IFSWIT(1).EQ.2) GO TO 14
      IF(IFSWIT(1).EQ.3) GO TO 35
   14 CONTINUE
      DO 18 I=1.10
 18   AKEF(I)=AKEFT(I)
      GO TO 35
 16   CONTINUE
      DO 15 I=1.10
      STORE(I)=AKEF(I)
      AKEF(I)= AKEFT(I)
      AKEFT(I)=STORE(I)
 15   CONTINUE
 35    CONTINUE
      WRITE(6.1009)AKEF,AKEFT
      DO 10 I=1.LS
      CVD(I)=ALOG10(COVRGD(MNT,I))
      TRKK(I)=TRPQZ(I)
10    CONTINUE
      KK=LS
      CALL GINT(CVD,TRKK,TT,CD,KK,20)
      NUM(I)=10**CD
      IF(LZ.EQ.3 )GO TO 84
      DO 1 I=1,7
      INO=5
      DO 11 J=1,INO
      DUM(J)=THICK(LMH,J,I)
11    CONTINUE
      KK=INO
      CALL GINT(DUM,COV,CD,TC,KK,10)
      THK(I)=TC
1     CONTINUE
      KK=7
      CALL GINT(THK,AKAY,XK,TTT,KK,7)
      DO 2 I=1,7
      THK(I)=THK(I)-TTT+TT
2     CONTINUE
84    CONTINUE
       Z=1
      IF(LZ.EQ.3) CALL RODTHK(NUM,Z,TRLL)
      DO 3  I=1,11
      IF(I.EQ.1) GO TO 4
      J=I-1
      AXXK=AKEF(J)
      IF(LZ.EQ.3) GO TO 77
      KK=7
      CALL GINT(THK,AKAY,AXXK,TTT,KK,7)
      GO TO 118
77     CONTINUE
      CALL COVSK(AXXK,XSTR,RP)
      TTT=RP*TRLL(I)
118     CONTINUE
      TBT(I)=TTT
      BT(I)=10.*FLOAT(J)
      GO TO 3
4     TBT(I)=TT
      BT(I)=0.
3     CONTINUE
      BIG=10000000.
      IF(IBTE.EQ.1.OR.IBTE.EQ.3)  FDE= 1.
      DO 5 I=3,51
      BSTK=FLOAT(I-1)*2.
      KK=2
      CALL SERCST(KK,BSTK,BASE)
       KK=11
      CALL GINT(TBT,BT,BSTK,TPAV,KK,11)
      SAVT=TPAV
      TPAV=AINT(TPAV+.74)
      KK=1
      IF(IFSWIT(1).NE.0)   GO TO 30
      IF(IRIGONA.NE.6) GO TO 30
      IF(TPAV.GT.BSTK) TPAV=30.
30    CONTINUE
      CALL SERCST(KK,TPAV,PAV)
```

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            WRITE(6,1019)TBT,BT,BSTK,TPAV,PAV,BASE
            IF(DRAIN.LT.0.5)GO TO 39
            IF(DRAIN.GT.2.5)GO TO 40
            CALL DRNAGE3(BSTK,TPAV)
            GO TO 39
      40    DRNCST=DRAIN
      39    IF(EARTHWK.LT.0.5)GO TO 49
            IF(EARTHWK.GT.10.)GO TO 50
            CALL EXCOST3(BSTK,TPAV)
            GO TO 49
      50    ERCOST=EARTHWK
      49    CSTPAB=BASE+PAV+(ERCOST/AREA)+(DRNCST/AREA)
            T=BSTK+TPAV
            IF(IFSWIT(1).EQ.3.OR.IFSWIT(1).EQ.2)  GO TO 21
            IF(IFSWIT(1).EQ.0) GO TO 20
      21    CONTINUE
            IF(T.LT.FDE) GO TO 5
      20    CONTINUE
            IF(CSTPAB.GE.BIG) GO TO 5
            BIG=CSTPAB
            PAVT=TPAV
            SVT=SAVT
            TBS=BSTK
            KK=7
            CALL GINT(AKAY,THK,SAVT,AKY,KK,7)
       5    CONTINUE
            DO 7 I=1,LS
            DO 13 K=1,7
            DO 12 J=1,INO
            DUM(J)=THICK(LMH,J,K)
      12    CONTINUE
            KK=INO
            CD=CVD(I)
            CALL GINT(DUM,COV,CD,TC,KK,10)
            THK(K)=TC
      13    CONTINUE
            TK=TRKK(I)
            KK=7
            CALL GINT(THK,AKAY,XK,TTT,KK,7)
            DO 8 J=1,7
            THK(J)=THK(J)-TTT+TK
       8    CONTINUE
            KK=7
            CALL GINT(THK,AKAY,AKY,TP,KK,7)
            TRKK(I)=TP
       7    CONTINUE
            W=6
            WRITE(W,1000) AKY
            WRITE(W,2000) (TRKK(I),I=1,LS)
            WRITE(W,3000) TBS,PAVT,SVT
            WRITE(W,4000) AKEFT
            RETURN
            END
      SUBROUTINE BTCT       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     4

      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     4  BTCT             1        166

 VARIABLES       SN  TYPE             RELOCATION
  1376  AKAY         REAL       ARRAY                      REFS          3         74         87        139        153        158
                                                        DEFINED         22
     0  AKEF         REAL       ARRAY     AKBLK            REFS          5         50         55         84    DEFINED         46         51
     0  AKEFT        REAL       ARRAY     ABLK3            REFS          4         46         51         55        165
                                                        DEFINED         52
    15  AKY          REAL                 AKBLK            REFS          5        139        158        162
     0  AREA         REAL                 ARBK             REFS          6      2*126
     0  AXK          REAL                 LCY              REFS         11
   770  AXXK         REAL                                  REFS         87         90    DEFINED         84
   773  BASE         REAL                                  REFS        104        115        126
    13  BIG          REAL                 AKBLK            REFS          5        133    DEFINED         99        134
   772  BSTK         REAL                                  REFS        104        106        112        115        118        123        127
                                                            137    DEFINED        102
  1027  BT           REAL       ARRAY                      REFS          2        106        115    DEFINED         94         97
   763  CD           REAL                                  REFS         61         62         70        148    DEFINED        147
  1443  COV          REAL       ARRAY                      REFS          3         70        148    DEFINED         23
   310  COVRGD       REAL       ARRAY     MIXBLK           REFS         12         57
   777  CSTPAR       REAL                                  REFS        133        134    DEFINED        126
     4  CUTPRCE      REAL                 TSV              REFS         18
  1405  CVD          REAL       ARRAY                      REFS          3         61        147    DEFINED         57
     1  DRAIN        REAL                 DRNBLK           REFS         10        116        117        120
     0  DRNCST       REAL                 DRNBLK           REFS         10        126    DEFINED        120
  1431  DUM          REAL       ARRAY                      REFS          3         70        148    DEFINED         67        144
     2  EARTHWK      REAL                 RL1              REFS         15        121        122        125
     1  ERCOST       REAL                 TSV              REFS         18        126    DEFINED        125
    26  FAC          REAL                 LCY              REFS         11
     6  FACTOR       REAL                 RL1              REFS         15
     1  FDE          REAL                 BSBLK            REFS          8        131    DEFINED        100
     3  FILPRCE      REAL                 TSV              REFS         18
   761  I            INTEGER                               REFS       2*46       2*50       2*51       2*52       2*57       2*58         67
                                                             71       2*76         82         83         93         94         96         97
                                                            102        147        151        159        163    DEFINED         45         49
                                                             56         64         75         81        101        141        163
     0  IBTE         INTEGER              BSBLK            REFS          8      2*100
     3  IDENT        INTEGER    ARRAY     RL1              REFS         15
     2  IDF          INTEGER              RODLOD           REFS         16
     0  IDR          INTEGER              RODLOD           REFS         16
     2  IFLEXNA      INTEGER              BLOCKD           REFS          7
    12  IFSWIT       INTEGER    ARRAY     ABLK3            REFS          4         41         42         43        110      2*128        129
   764  INO          INTEGER                               REFS         66         69        143        146    DEFINED         65
     3  IRIGDNA      INTEGER              BLOCKD           REFS          7        111
   765  J            INTEGER                               REFS       2*67         84         94      2*144      2*155
                                                        DEFINED         66         83        143        154
  1002  K            INTEGER                               REFS        144        149    DEFINED        142
   762  KK           INTEGER                               REFS         61         70         74         87        104        106        114
                                                            139        148        153        158    DEFINED         60         69         73
                                                             86        103        105        109        138        146        152        157
     1  K4           INTEGER              RL1              REFS         15
     0  K7           INTEGER              RL1              REFS         15
     0  LMH          INTEGER              TYPBK            REFS         19         67        144
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      SUBROUTINE BTCT       74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420       09/02/77  13.54.00       PAGE     5

VARIABLES     SN TYPE              RELOCATION
  27  LS           INTEGER              LCY           REFS       11       56       60      141      163
   1  LZ           INTEGER              RODLOD        REFS       16       63       80       85
   0  MNT          INTEGER              DOM           REFS        9       57
   5  NERTH        INTEGER              TSV           REFS       18  DEFINED       40
   5  NODQ         INTEGER              NBLK          REFS       13
   0  NOGQ         INTEGER              NBLK          REFS       13
   1  NOHQ         INTEGER              NBLK          REFS       13
   6  NOSGQ        INTEGER              NBLK          REFS       13
   2  NPTQ         INTEGER              NBLK          REFS       13
1455  NUM          REAL       ARRAY                   REFS       21       80  DEFINED       62
   3  NXQ          INTEGER              NBLK          REFS       13
   4  NYQ          INTEGER              NBLK          REFS       13
 776  PAV          REAL                               REFS      114      115      126
  12  PAVT         REAL                 AKBLK         REFS        5      164  DEFINED      135
   2  PSTEP        REAL                 TSV           REFS       18
   0  PVTFLX       REAL                 BLOCKD        REFS        7
   1  PVTRGD       REAL                 BLOCKD        REFS        7
 771  RP           REAL                               REFS       90       91
 775  SAVT         REAL                               REFS      136      139  DEFINED      107
1042  STORE        REAL       ARRAY                   REFS        2       52  DEFINED       50
   0  STORE1       REAL       ARRAY     MIXBLK        REFS       12
 144  STORE2       REAL       ARRAY     MIXBLK        REFS       12
1001  SVT          REAL                               REFS      164  DEFINED      136
1000  T            REAL                               REFS      131  DEFINED      127
  14  TRS          REAL                 AKBLK         REFS        5      164  DEFINED      137
1014  TBT          REAL       ARRAY                   REFS        2      106      115  DEFINED       93       96
 766  TC           REAL                               REFS       70       71      148      149
   0  THCK         REAL                 TSV           REFS       18
   0  THFF         REAL       ARRAY     THKBK         REFS       17
1054  THICK        REAL       ARRAY                   REFS        3       67      144  DEFINED       24       25       26
                                                        27       28       29       30       31       32       33
1005  THK          REAL       ARRAY                   REFS        2       74       76       87      139      153      155
                                                       158  DEFINED       71       76      149      155
1003  TK           REAL                               REFS      155  DEFINED      151
1004  TP           REAL                               REFS      158      159
 774  TPAV         REAL                               REFS      106      107      108      112      114      115      118
                                                       123      127      135  DEFINED      108      112
  24  TRKK         REAL       ARRAY     THKBK         REFS       17       61      151      163  DEFINED       58      159
1457  TRLL         REAL       ARRAY                   REFS       21       80       91
   0  TRPQZ        REAL       ARRAY     PQZ           REFS       14       58
   2  TRY          REAL       ARRAY     LCY           REFS       11
   0  TT           REAL                  F.P.         REFS       61       76       96  DEFINED        1
 767  TTT          REAL                               REFS       74       76       87       93      153      155
                                                   DEFINED       91
 757  W            INTEGER                            REFS       20  DEFINED      161 I/O REFS      162      163      164
                                                       165
  30  XCBR         REAL                 LCY           REFS       11
   7  XK           REAL                 NBLK          REFS       13       74      153
  31  XSTR         REAL                 LCY           REFS       11       90
   1  YK           REAL                 LCY           REFS       11
 760  Z            INTEGER                            REFS       20       80  DEFINED       79

FILE NAMES         MODE
      TAPE6        FMT                     WRITES       55      115
      VARIABLES USED AS FILE NAMES, SEE ABOVE
      SUBROUTINE BTCT       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     6

EXTERNALS          TYPE    ARGS        REFERENCES
      ALOG10       REAL      1 LIBRARY     57
      COVSK                  3             90
      DRNAGE3                2            118
      EXCOST3                2            123
      GINT                   6             61       70        74        87       106       139       148       153       158
      RODTHK                 3             80
      SERCST                 3            104      114

INLINE FUNCTIONS   TYPE    ARGS          DEF LINE  REFERENCES
      AINT         REAL      1  INTRIN               108
      FLOAT        REAL      1  INTRIN                94       102

STATEMENT LABELS                DEF LINE   REFERENCES
    0  1                            72         64
    0  2                            77         75
  242  3                            98         81       95
  235  4                            96         82
  417  5                           140        101      131       133
    0  7                           160        141
    0  8                           156        154
    0  10                           59         56
    0  11                           68         66
    0  12                          145        143
    0  13                          150        142
   31  14                           44         42
    0  15                           53         49
   41  16                           48         41
    0  18                           46         45
  377  20                          132        129
  373  21                          130        128
  315  30                          113        110      111
   60  35                           54         43       47
  336  39                          121        116      119
  333  40                          120        117
  352  49                          126        121      124
  347  50                          125        122
  216  77                           89         85
  164  84                           78         63
  224  118                          92         88
  641  1000     FMT                 34        162
  647  1009     FMT                 35         55
  653  1019     FMT                 36        115
  660  2000     FMT                 37        163
  667  3000     FMT                 38        164
  676  4000     FMT                 39        165

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   33  18          I         45 46         4B       INSTACK
   43  15          I         49 53        14B         OPT
   64  10        * I         56 59        15B                     EXT REFS
  117  1         * I         64 72        27B                     EXT REFS  NOT INNER
  123  11          J         66 68        11B         OPT
  154  2           I         75 77         7B       INSTACK
  174  3         * I         81 98        51B                     EXT REFS
  257  5         * I        101 140      143B                     EXT REFS
  424  7         * I        141 160       64B                     EXT REFS  NOT INNER
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      SUBROUTINE BTCT        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00         PAGE      7

LOOPS  LABEL     INDEX       FROM-TO     LENGTH     PROPERTIES
  426  13      * K            142 150       30B              EXT REFS  NOT INNER
  430  12        J            143 145       11B         OPT
  467  8         J            154 156        7B      INSTACK

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       ABLK3         20                  0 AKEFT   (10)               10 IFSWIT (10)
       AKBLK         14                  0 AKEF    (10)               10 PAVT   (1)               11 BIG     (1)
                                        12 TBS     (1)                13 AKY    (1)
       ARBK           1                  0 AREA    (1)
       BLOCKD         4                  0 PVTFLX  (1)                 1 PVTRGD (1)                2 IFLEXNA(1)
                                         3 IRIGDNA(1)
       BSBLK          2                  0 IBTE    (1)                 1 FDE    (1)
       DOM            1                  0 MNT     (1)
       DRNBLK         2                  0 DRNCST  (1)                 1 DRAIN  (1)
       LCY           26                  0 AXK     (1)                 1 YK     (1)                2 TRY     (20)
                                        22 FAC     (1)                23 LS     (1)               24 XCBR    (1)
                                        25 XSTR    (1)
       MIXBLK       400                  0 STORE1  (100)             100 STORE2 (100)            200 COVRGD  (200)
       NBLK           8                  0 NOGQ    (1)                 1 NOHQ   (1)                2 NPTQ    (1)
                                         3 NXQ     (1)                 4 NYQ    (1)                5 NODQ    (1)
                                         6 NOSGQ   (1)                 7 XK     (1)
       PQZ           20                  0 TRPQZ   (20)
       RL1            7                  0 K7      (1)                 1 K4     (1)                2 EARTHWK(1)
                                         3 IDENT   (3)                 6 FACTOR (1)
       RODLOD         3                  0 IDR     (1)                 1 LZ     (1)                2 IDF     (1)
       THKBK         40                  0 THFF    (20)               20 TRKK   (20)
       TSV            6                  0 THCK    (1)                 1 ERCOST (1)                2 PSTEP   (1)
                                         3 FILPRCE(1)                  4 CUTPRCE(1)                5 NERTH   (1)
       TYPBK          1                  0 LMH     (1)

STATISTICS
  PROGRAM LENGTH                14638     819
  CM LABELED COMMON LENGTH      10538     555
```

```
       SUBROUTINE SERCST     74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00       PAGE     1

      1                SUBROUTINE SERCST(N,P,SYC)
                       DIMENSION C(10),PAR(10)
                       COMMON /CSTBK/ CCCST(50,10,2)
                  1000 FORMAT(//" **STOP FROM SUBROUTINE SERCST-CALL FOR NONEXISTENT COST
      5               1 DATA")
                       NUM=INT(CCCST(N,1,1)+.1)+2
                       IF(NUM.EQ.2) WRITE(8,1000)
                       IF(NUM.EQ.2) STOP 3321
                       DO 1 I=2,NUM
     10                J=I-1
                       C(J)=CCCST(N,I,2)
                       PAR(J)=CCCST(N,I,1)
                  1    CONTINUE
                       L=NUM-1
     15                IF(P.LE.CCCST(N,NUM,1)) GO TO 3
                       J=J+1
                       C(J)=(101-PAR(J-2))*(C(J-1)-C(J-2))/(PAR(J-1)-PAR(J-2))+C(J-2)
                       PAR(J)=101
                       L=NUM
     20                M=11
                  3    CALL GINT(C,PAR,P,SYC,L,M)
                       RETURN
                       END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    4  SERCST          1       22

VARIABLES     SN  TYPE            RELOCATION
  145  C         REAL       ARRAY                 REFS          2      3*17        21    DEFINED       11        17
    0  CCCST     REAL       ARRAY    CSTBK        REFS          3         6        11         12       15
  141  I         INTEGER                          REFS         10        11        12    DEFINED        9
  142  J         INTEGER                          REFS         11        12        16       7*17       18
                                               DEFINED         10        16
  143  L         INTEGER                          REFS         21   DEFINED        14         19
  144  M         INTEGER                          REFS         21   DEFINED        20
    0  N         INTEGER              F.P.        REFS          6        11        12         15  DEFINED         1
  140  NUM       INTEGER                          REFS          7         8         9         14       15        19
                                               DEFINED          6
    0  P         REAL                 F.P.        REFS         15        21   DEFINED          1
  157  PAR       REAL       ARRAY                 REFS          2      3*17        21    DEFINED       12        18
    0  SYC       REAL                 F.P.        REFS         21   DEFINED         1

FILE NAMES       MODE
       TAPE8     FMT                   WRITES        7

EXTERNALS          TYPE   ARGS       REFERENCES
       GINT                  6             21

INLINE FUNCTIONS   TYPE   ARGS      DEF LINE  REFERENCES
       INT       INTEGER     1  INTRIN             6
```

```
        SUBROUTINE SERCST      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     2

     STATEMENT LABELS                    DEF LINE    REFERENCES
         0  1                                13           9
       106  3                                21          15
       123  1000      FMT                     4           7

     LOOPS  LABEL      INDEX       FROM-TO      LENGTH     PROPERTIES
        35  1          I             9 13         20B           OPT

     COMMON BLOCKS     LENGTH       MEMBERS - BIAS NAME(LENGTH)
           CSTBK        1000                    0 CCCST  (1000)

     STATISTICS
       PROGRAM LENGTH                     202B       130
       CM LABELED COMMON LENGTH          1750B      1000
```

```
      OVERLAY(LIFE,4,0)
      PROGRAM EARTH
      COMMON/PLOTS/IPLOT,IP,DIST(100),CVOL(100)
      COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
      COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
     1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
     2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
     3ELIMLO
      COMMON /RL1/ K7,K4,EARTHWK,IDENT(3),FACTOR
      COMMON /TMPL/ IND,SWID,TWOCL,JACK
      COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
     1OT
      COMMON /ACNT/KAPRCNT
      SPSTEP=10E50
      IROW=KAPR=0
      KAPRCNT=KAPR
      NTMP=NPGL=0
      CALL INPUT
      REWIND 2
      REWIND 3
      CALL ERROR(99)
13    IP=0
      ISCNT=0
      VL=0.
      DIS=0.
      VOL=0.
      FILLNET=CUTNET=0.0
      IF(KAPR .NE. 0)GO TO 4
      WRITE(11,100)SEGBEG,SEGEND
      WRITE(11,102)
102   FORMAT(5X,*FILL IS POSITIVE--CUT IS NEGATIVE*)
4     HYPGL=SQRT((RUNE(1)-RUNS(1))**2+(RUNE(2)-RUNS(2))**2)
      IF((ABS(HYPGL-SEGEND).GT.0.00001).A.SEGEND.GT.HYPGL)CALL ERROR(6)
      PGLA=RUNS(1)+SEGBEG*SINPGL
      PGLB=RUNS(2)+SEGBEG*COSPGL
      AREA1=TMPAREA(SEGBEG)-TERAREA(PGLA,PGLB)
      AREA1=AREA1/9.
      IF(KAPR.NE.0)GO TO5
      WRITE(11,101)ISCNT,DIS,PSTEP,AREA1,VL,VOL
      WRITE (2) AREA1
5     IF(KAPR.NE.0)WRITE(3)AREA1
      POINT=SEGBEG
2     IF(POINT+PSTEP.GT.SEGEND)PSTEP=SEGEND-POINT
      POINT=POINT+PSTEP
      PGLA=RUNS(1)+POINT*SINPGL
      PGLB=RUNS(2)+POINT*COSPGL
      AREA2=TMPAREA(POINT)-TERAREA(PGLA,PGLB)
      AREA2=AREA2/9.
      VL=.5*(AREA1+AREA2)*PSTEP
      VL=VL/3.
      DIS=DIS+PSTEP
      VOL=VOL+VL
      AREA1=AREA2
      ISCNT=ISCNT+1
      IF(KAPR.NE.0)GO TO 6
      WRITE(11,101)ISCNT,DIS,PSTEP,AREA1,VL,VOL
      WRITE (2) AREA1
      6    IF(KAPR.NE.0)WRITE(3)AREA1
           IP=IP+1
           IF(IP.GT.100)GO TO 10
      3    DIST(IP)=DIS
           CVOL(IP)=VOL
           IF(VL.GT.0.0)FILLNET=FILLNET+VL
           IF(VL.LT.0.0)CUTNET=CUTNET+VL
           IF(POINT.LT.SEGEND)GO TO 2
           IF(KAPR.NE.0)GO TO 8
           CALL ERROR(98)
           CALL ERROR(100)
           ENDFILE 2
           IF(IPLOT.NE.0)CALL LPLOT
           IF(EARTHWK.EQ.2)GO TO 11
     14    CALL PRICE
           IF(EARTHWK.EQ.2)CALL ZPRICE
           GO TO 1
     11    IF(KAPR.LT.NAPR)GO TO 12
           GO TO 14
     12    KAPR=KAPR+1
           KAPRCNT=KAPR
           CALL ZONE(KAPR)
           GO TO 13
      8    ENDFILE 3
           GO TO 11
     10    IP=100
           IF(KAPR.NE.0)GO TO 7
           IF(IPLOT.NE.0) CALL LPLOT
           IP=1
           WRITE(11,100)SEGBEG,SEGEND
           GO TO 3
      7    IP=1
           GO TO 3
    100    FORMAT(1H1//* SEGMENT DISPLAY RUNS FROM*,F15.0,*TO*,F15.0 //
          1*  PRISM NO.*,T17,*DIST. FROM SEG.*,T38,*STEP SIZE*,T57,*END AREA*
          2,T78,*PRISM VOL*  ,T99,*CUMULATIVE VOL.*/T17,*ORIGIN (FEET)*,T57,
          3*(SQ.YDS.)*,T78,*(CU.YDS)*,T99,*(CU.YDS.)*//)
    101    FORMAT(1X,I5,4X,5F20.0)
      1    CONTINUE
           END
```

```
     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
   3  EARTH          2

VARIABLES      SN  TYPE           RELOCATION
   55  APREND      REAL       ARRAY    ZONES         REFS       11
   22  APRSTR      REAL       ARRAY    ZONES         REFS       11
  111  APTOT       REAL                ZONES         REFS       11
   11  APWID       REAL       ARRAY    ZONES         REFS       11
  513  AREA1       REAL                              REFS       37         39         40         41         49         56         57
                                                       58    DEFINED      36         37         53
```

```
          PROGRAM EARTH      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00         PAGE     3

VARIABLES     SN  TYPE               RELOCATION
   515  AREA2    REAL                              REFS       48       49       53  DEFINED       47       48
    13  COSPGL   REAL            / /               REFS        5       35       46
 10070  CUTCOST  REAL            / /               REFS        5
 10067  CUTNET   REAL            / /               REFS        5       64  DEFINED       27       64
     4  CUTPRCE  REAL            TSV               REFS        4
   146  CVOL     REAL     ARRAY  PLOTS             REFS        3  DEFINED       62
   506  DIS      REAL                              REFS       39       51       56       61  DEFINED       25       51
     2  DIST     REAL     ARRAY  PLOTS             REFS        3  DEFINED       61
     2  EARTHWK  REAL            RL1               REFS        9       71       73
 10072  ECOST    REAL            / /               REFS        5
 10073  ELIMHI   REAL            / /               REFS        5
 10074  ELIMLO   REAL            / /               REFS        5
     1  ERCOST   REAL            TSV               REFS        4
     6  FACTOR   REAL            RL1               REFS        9
 10071  FILCOST  REAL            / /               REFS        5
 10066  FILLNET  REAL            / /               REFS        5       63  DEFINED       27       63
     3  FILPRCE  REAL            TSV               REFS        4
   510  HYPGL    REAL                              REFS     2*33  DEFINED       32
     3  IDENT    INTEGER  ARRAY  RL1               REFS        9
     2  IEXTRAP  INTEGER         / /               REFS        5
     0  IND      INTEGER         TMPL              REFS       10
     1  IP       INTEGER         PLOTS             REFS        3       59       60       61       62
                                                DEFINED       22       59       83       86       89
     0  IPLOT    INTEGER         PLOTS             REFS        3       70       85
   221  IROW     INTEGER         / /               REFS        5  DEFINED       15
   504  ISCNT    INTEGER                           REFS       39       54       56  DEFINED       23       54
     3  JACK     INTEGER         TMPL              REFS       10
   503  KAPR     INTEGER                           REFS       16       28       38       41       55       58       66
                                                     75       77       78       79       84  DEFINED       15       77
     0  KAPRCNT  INTEGER         ACNT              REFS       13  DEFINED       16       78
     1  K4       INTEGER         RL1               REFS        9
     0  K7       INTEGER         RL1               REFS        9
   110  NAPR     INTEGER         ZONES             REFS       11       75
     5  NERTH    INTEGER         TSV               REFS        4
    65  NPGL     INTEGER         / /               REFS        5  DEFINED       17
    64  NTMP     INTEGER         / /               REFS        5  DEFINED       17
    67  PGL      REAL     ARRAY  / /               REFS        5
   511  PGLA     REAL                              REFS       36       47  DEFINED       34       45
   512  PGLB     REAL                              REFS       36       47  DEFINED       35       46
   514  POINT    REAL                              REFS     2*43       44       45       46       47       65
                                                DEFINED       42       44
     2  PSTEP    REAL            TSV               REFS        4       39       43       44       49       51       56
                                                DEFINED       43
    66  RELAREA  REAL            / /               REFS        5
     6  RUNE     REAL     ARRAY  / /               REFS        5     2*32
     3  RUNS     REAL     ARRAY  / /               REFS        5     2*32       34       35       45       46
     0  SEGBEG   REAL            / /               REFS        5       29       34       35       36       42       87
     1  SEGEND   REAL            / /               REFS        5       29     2*33     2*43       65       87
    12  SINPGL   REAL            / /               REFS        5       34       45
    11  SPSTEP   REAL            / /               REFS        5  DEFINED       14
     1  SWID     REAL            TMPL              REFS       10
   222  TER      REAL     ARRAY  / /               REFS        5
     0  THCK     REAL            TSV               REFS        4
 10062  TLSTART  REAL     ARRAY  / /               REFS        5
 10064  TLSTOP   REAL     ARRAY  / /               REFS        5
    14  TMP      REAL     ARRAY  / /               REFS        5
     2  TWOCL    REAL            TMPL              REFS       10
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           PROGRAM EARTH       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     4
 VARIABLES      SN  TYPE               RELOCATION
   505  VL          REAL                                 REFS         39         50         52         56        2*63       2*64
                                                      DEFINED         24         49         50
   507  VOL         REAL                                 REFS         39         52         56         62     DEFINED        26         52
   137  WHERE       REAL          ARRAY     / /          REFS          5
     0  ZONSTEP     REAL          ARRAY     ZONES        REFS         11

 FILE NAMES         MODE
        TAPE11      FMT                     WRITES        29         30         39         56         87
        TAPE2       UNFMT                   WRITES        40         57     MOTION         19         69
        TAPE3       UNFMT                   WRITES        41         58     MOTION         20         81

 EXTERNALS              TYPE     ARGS        REFERENCES
        ERROR                     1              21       33         67         68
        INPUT                     0              18
        LPLOT                     0              70       85
        PRICE                     0              72
        SQRT        REAL          1  LIBRARY     32
        TERAREA     REAL          2              36       47
        TMPAREA     REAL          1              36       47
        ZONE                      1              79
        ZPRICE                    0              73

 INLINE FUNCTIONS       TYPE     ARGS          DEF LINE   REFERENCES
        ABS         REAL          1  INTRIN                   33

 STATEMENT LABELS                 DEF LINE     REFERENCES
   317  1                           96            74
   122  2                           43            65
   211  3                           61            88          90
    47  4                           32            28
   114  5                           41            38
   200  6                           58            55
   314  7                           89            84
   274  8                           81            66
   300  10                          83            60
   257  11                          75            71          82
   264  12                          77            75
    25  13                          22            80
   250  14                          72            76
   432  100        FMT              91            29          87
   464  101        FMT              95            39          56
   357  102        FMT              31            30

COMMON  BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
        PLOTS        202                0 IPLOT   (1)                   1 IP       (1)                  2 DIST    (100)
                                      102 CVOL    (100)
        TSV            6                0 THCK    (1)                   1 EHCOST (1)                    2 PSTEP   (1)
                                        3 FILPRCE(1)                    4 CUTPRCE(1)                    5 NERTH   (1)
        / /         4157                0 SEGBEG (1)                    1 SEGEND (1)                    2 IEXTRAP(1)
                                        3 RUNS    (3)                   6 RUNE    (3)                   9 SPSTEP (1)
                                       10 SINPGL (1)                   11 COSPGL (1)                   12 TMP     (40)
                                       52 NTMP    (1)                  53 NPGL    (1)                  54 RELAREA(1)
                                       55 PGL     (40)                 95 WHERE   (50)                145 IROW    (1)
                                      146 TER     (4000)             4146 TLSTART(2)                 4148 TLSTOP (2)
                                     4150 FILLNET(1)                 4151 CUTNET (1)                 4152 CUTCOST(1)
                                     4153 FILCOST(1)                 4154 ECOST   (1)                4155 ELIMHI (1)
                                     4156 ELIMLO (1)
        PROGRAM EARTH        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE     5
 COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
     BL1             7                   0 K7       (1)         1 K4       (1)            2 EARTHWK(1)
                                         3 IDENT    (3)         6 FACTOR   (1)
     TMPL            4                   0 IND      (1)         1 SWID     (1)            2 TWOCL    (1)
                                         3 JACK     (1)
     ZONES          74                   0 ZONSTEP(9)           9 APWID    (9)           18 APRSTR (27)
                                        45 APREND (27)         72 NAPR     (1)           73 APTOT    (1)
     ACNT            1                   0 KAPRCNT(1)
 STATISTICS
   PROGRAM LENGTH
   CM LABELED COMMON LENGTH      516B       334
   CM BLANK COMMON LENGTH        446B       294
                               10075B      4157
        FUNCTION TERAREA    74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420       09/02/77  13.54.00        PAGE     1

     1                   FUNCTION TERAREA(PGLA,PGLB)
                         COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
                        1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
                        2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
     5                  3ELIMLO
                         COMMON /TMPL/ IND,SWID,TWOCL,JACK
                         TSTRT=TMP(1,1)
                         AREA=0.
                         TEND=TMP(NTMP,1)
    10                   SWID=ABS((TEND-TSTRT)/3)
                         APO=-COSPGL*TSTRT+PGLA
                         BPO=SINPGL*TSTRT+PGLB
                         EVO=ELEV(APO,BPO)
                  1      CALL NXTPNT(APO,BPO,STEP)
    15                   IF(TSTRT+STEP.GT.TEND)STEP=TEND-TSTRT
                         TSTRT=TSTRT+STEP
                         AP=-COSPGL*TSTRT+PGLA
                         BP=SINPGL*TSTRT+PGLB
                         EV=ELEV(AP,BP)
    20                   AREA=AREA+((EV+EVO)/2.)*STEP
                         APO=AP
                         BPO=BP
                         EVO=EV
                         IF(TSTRT.LT.TEND)GO TO 1
    25                   TERAREA=AREA
                         RETURN
                         END


      SYMBOLIC REFERENCE MAP (R=3)

  ENTRY POINTS      DEF LINE      REFERENCES
      5  TERAREA          1          26

  VARIABLES      SN  TYPE             RELOCATION
     131  AP         REAL                              REFS       19        21   DEFINED      17
     125  APO        REAL                              REFS       13        14   DEFINED      11        21
     123  AREA       REAL                              REFS       20        25   DEFINED       8        20
     132  BP         REAL                              REFS       19        22   DEFINED      18
     126  BPO        REAL                              REFS       13        14   DEFINED      12        22
      13  COSPGL     REAL                   / /        REFS        2        11        17
   10070  CUTCOST    REAL                   / /        REFS        2
   10067  CUTNET     REAL                   / /        REFS        2
   10072  ECOST      REAL                   / /        REFS        2
   10073  ELIMHI     REAL                   / /        REFS        2
   10074  ELIMLO     REAL                   / /        REFS        2
     133  EV         REAL                              REFS       20        23   DEFINED      19
     127  EVO        REAL                              REFS       20   DEFINED        13        23
   10071  FILCOST    REAL                   / /        REFS        2
   10066  FILLNET    REAL                   / /        REFS        2
       2  IEXTRAP    INTEGER                / /        REFS        2
       0  IND        INTEGER                TMPL       REFS        6
     221  IROW       INTEGER                / /        REFS        2
       3  JACK       INTEGER                TMPL       REFS        6
```

```
         FUNCTION TERAREA    74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00       PAGE     2

VARIABLES     SN  TYPE            RELOCATION
   65 NPGL       INTEGER               / /          REFS         2
   64 NTMP       INTEGER               / /          REFS         2         9
   67 PGL        REAL       ARRAY      / /          REFS         2
    0 PGLA       REAL                   F.P.        REFS        11        17   DEFINED         1
    0 PGLB       REAL                   F.P.        REFS        12        18   DEFINED         1
   66 RELAREA    REAL                  / /          REFS         2
    6 RUNE       REAL       ARRAY      / /          REFS         2
    3 RUNS       REAL       ARRAY      / /          REFS         2
    0 SEGBEG     REAL                  / /          REFS         2
    1 SEGEND     REAL                  / /          REFS         2
   12 SINPGL     REAL                  / /          REFS         2        12        18
   11 SPSTEP     REAL                  / /          REFS         2
  130 STEP       REAL                               REFS        14        15        16        20   DEFINED        15
    1 SWID       REAL                  TMPL         REFS         6   DEFINED        10
  124 TEND       REAL                               REFS        10      2*15        24   DEFINED         9
  222 TER        REAL       ARRAY      / /          REFS         2
  121 TERAREA    REAL                             DEFINED       25
10062 TLSTART    REAL       ARRAY      / /          REFS         2
10064 TLSTOP     REAL       ARRAY      / /          REFS         2
   14 TMP        REAL       ARRAY      / /          REFS         2         7         9
  122 TSTRT      REAL                               REFS        10        11        12      2*15        16        17        18
                                                      24   DEFINED         7        16
    2 TWOCL      REAL                  TMPL         REFS         6
  137 WHERE      REAL       ARRAY      / /          REFS         2

EXTERNALS          TYPE   ARGS       REFERENCES
       ELEV      REAL       2            13         19
       NXTPNT               3            14

INLINE FUNCTIONS   TYPE   ARGS       DEF LINE  REFERENCES
       ABS       REAL       1  INTRIN              10

STATEMENT LABELS               DEF LINE   REFERENCES
   36  1                          14         24

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       / /      4157               0 SEGBEG (1)             1 SEGEND (1)             2 IEXTRAP(1)
                                   3 RUNS   (3)             6 RUNE   (3)             9 SPSTEP (1)
                                  10 SINPGL (1)            11 COSPGL (1)            12 TMP    (40)
                                  52 NTMP   (1)            53 NPGL   (1)            54 RELAREA(1)
                                  55 PGL    (40)           95 WHERE  (50)          145 IROW   (1)
                                 146 TER    (4000)       4146 TLSTART(2)          4148 TLSTOP (2)
                                4150 FILLNET(1)          4151 CUTNET (1)          4152 CUTCOST(1)
                                4153 FILCOST(1)          4154 ECOST  (1)          4155 ELIMHI (1)
                                4156 ELIMLO (1)
       TMPL         4              0 IND    (1)             1 SWID   (1)             2 TWOCL  (1)
                                   3 JACK   (1)

STATISTICS
  PROGRAM LENGTH                134B      92
  CM LABELED COMMON LENGTH        4B       4
  CM BLANK COMMON LENGTH      10075B    4157
```

```
            FUNCTION ELEV(A,B)
            COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
           1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
           2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
           3ELIMLO
            COMMON /ACNT/KAPRCNT
            QINT(I,J,K)=((B-TER(I,J,1))/(TER(I,K,1)-TER(I,J,1)))*(TER(I,K,2)-
           1TER(I,J,2))+TER(I,J,2)
            DO 1 I=1,IROW
            IF(WHERE(I).GT.A)GO TO 2
            IF(WHERE(I).EQ.A)GO TO 20
      1     CONTINUE
            IF(IEXTRAP.NE.0)CALL ERROR(1)
            GO TO 30
     10     IF(IEXTRAP.NE.0)CALL ERROR(1)
            IBEG=IEND
            IEND=IEND+1
            GO TO 3
      2     IBEG=I-1
            IEND=I
            IF(IBEG.EQ.0)GO TO 10
      3     CALL SEARCH(IBEG,B,LESSB,MOREB)
            CALL SEARCH(IEND,B,LESSE,MOREE)
            BEG=QINT(IBEG,LESSB,MOREB)
            END=QINT(IEND,LESSE,MOREE)
            ELEV=(A-WHERE(IBEG))/(WHERE(IEND)-WHERE(IBEG))*(END-BEG)+BEG
            IF(KAPRCNT.NE.0)RETURN
            IF(ELEV.GE.ELIMHI)GO TO 40
            IF (ELEV.LE.ELIMLO) GO TO 50
            RETURN
     40     CALL ERROR (31)
            IF (BEG.GE.END)GO TO 41
            IF(END.GT.ELIMHI)GO TO 42
            ELEV=END
            RETURN
     41     IF(BEG.GT.ELIMHI)GO TO 43
            ELEV=BEG
            RETURN
     43     IF(TER(IBEG,MOREB,2).GT.TER(IBEG,LESSB,2))GO TO 44
            ELEV=TER(IBEG,LESSB,2)
            RETURN
     44     ELEV=TER(IBEG,MOREB,2)
            RETURN
     42     IF(TER(IEND,MOREE,2).GT.TER(IEND,LESSE,2))GO TO 45
            ELEV=TER(IEND,LESSE,2)
            RETURN
     45     ELEV=TER(IEND,MOREE,2)
            RETURN
     50     CALL ERROR (32)
            IF(BEG.LE.END)GO TO 51
            IF(END.LT.ELIMLO)GO TO 52
            ELEV=END
            RETURN
     51     IF(BEG.LT.ELIMLO)GO TO 53
            ELEV=BEG
            RETURN
     53     IF(TER(IBEG,LESSB,2).LE.TER(IBEG,MOREB,2))GO TO 54
```

```
                     ELEV=TER(IBEG.MOREB.2)
                     RETURN
 60           54     ELEV=TER(IBEG.LESSB.2)
                     RETURN
              52     IF(TER(IEND,MOREE.2).LT.TER(IEND.LESSE.2))GO TO 55
                     ELEV=TER(IEND.LESSE.2)
                     RETURN
 65           55     ELEV=TER(IEND.MOREE.2)
                     RETURN
              20     CALL SEARCH(I.8.LESS.MORE)
                     ELEV=DINT(I.LESS.MORE)
                     IF(KAPPCNT.NE.0)RETURN
 70                  IF(ELEV.GE.ELIMHI)GO TO 60
                     IF(ELEV.LE.ELIMLO)GO TO 70
                     RETURN
              60     CALL ERROR(31)
                     IF(TER(I.LESS.2).GE.TER(I,MORE,2))GO TO 61
 75                  ELEV=TER(I.MORE.2)
                     RETURN
              61     ELEV=TER(I.LESS.2)
                     RETURN
              70     CALL ERROR(32)
 80                  IF(TER(I.LESS.2).LE.TER(I,MORE,2))GO TO 71
                     ELEV=TER(I,MORE.2)
                     RETURN
              71     ELEV=TER(I.LESS.2)
                     RETURN
 85           30     IBEG=IROW-1
                     IEND=IROW
                     GO TO 3
                     END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
    5  ELEV              1       27        30        35        38        41        43        46        48        53        56
                                 59        61        64        66        69        72        76        78        82        84

VARIABLES      SN  TYPE            RELOCATION
    0  A           REAL                F.P.      REFS        10        11        26   DEFINED         1
    0  B           REAL                F.P.      REFS        22        23        24        25        67        68
                                              DEFINED         1
  454  BEG         REAL                          REFS      2*26        32        36        37        50        54        55
                                              DEFINED        24
   13  COSPGL      REAL                / /       REFS         2
10070  CUTCOST     REAL                / /       REFS         2
10067  CUTNET      REAL                / /       REFS         2
10072  ECOST       REAL                / /       REFS         2
  444  ELEV        REAL                          REFS        28        29        70        71   DEFINED        26        34
                                                   37        40        42        45        47        52        55        58
                                                   60        63        65        68        75        77        81        83
10073  ELIMHI      REAL                / /       REFS         2        28        33        36        70
10074  ELIMLO      REAL                / /       REFS         2        29        51        54        71
```

```
         FUNCTION ELEV       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00      PAGE     3

VARIABLES       SN  TYPE              RELOCATION
   455  END         REAL                                  REFS      26       32       33       34       50       51       52
                                                       DEFINED      25
 10071  FILCOST     REAL                    / /           REFS       2
 10066  FILLNET     REAL                    / /           REFS       2
   445  I           INTEGER                               REFS      10       11       19       20       67     6*68     2*74
                                                            75      77     2*80       81       83  DEFINED        9
   446  IBEG        INTEGER                               REFS      21       22     6*24     2*26     2*39       40       42
                                                          2*57      58       60  DEFINED       16       19       85
   447  IEND        INTEGER                               REFS      16       17       23     6*25       26     2*44       45
                                                            47    2*62       63       65  DEFINED       17       20       86
     2  IEXTRAP     INTEGER                 / /           REFS       2       13       15
   221  IROW        INTEGER                 / /           REFS       2        9       85       86
     0  KAPRCNT     INTEGER                 ACNT          REFS       6       27       69
   456  LESS        INTEGER                               REFS      67     4*68       74       77       80       83
   450  LESSB       INTEGER                               REFS      22     4*24       39       40       57       60
   452  LESSE       INTEGER                               REFS      23     4*25       44       45       62       63
   457  MORE        INTEGER                               REFS      67     2*68       74       75       80       81
   451  MOREB       INTEGER                               REFS      22     2*24       39       42       57       58
   453  MOREE       INTEGER                               REFS      23     2*25       44       47       62       65
    65  NPGL        INTEGER                 / /           REFS       2
    64  NTMP        INTEGER                 / /           REFS       2
    67  PGL         REAL          ARRAY     / /           REFS       2
    66  RELAREA     REAL                    / /           REFS       2
     6  RUNE        REAL          ARRAY     / /           REFS       2
     3  RUNS        REAL          ARRAY     / /           REFS       2
     0  SEGBEG      REAL                    / /           REFS       2
     1  SEGEND      REAL                    / /           REFS       2
    12  SINPGL      REAL                    / /           REFS       2
    11  SPSTEP      REAL                    / /           REFS       2
   222  TER         REAL          ARRAY     / /           REFS       2     6*24     6*25     2*39       40       42     2*44
                                                            45      47     2*57       58       60     2*62       63       65
                                                          6*68    2*74       75       77     2*80       81       83
 10062  TLSTART     REAL          ARRAY     / /           REFS       2
 10064  TLSTOP      REAL          ARRAY     / /           REFS       2
    14  TMP         REAL          ARRAY     / /           REFS       2
   137  WHERE       REAL          ARRAY     / /           REFS       2       10       11     3*26

EXTERNALS          TYPE   ARGS        REFERENCES
        ERROR               1               13      15      31       49       73       79
        SEARCH              4               22      23      67

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
        QINT       REAL     3    SF         7        24      25       68

STATEMENT LABELS                DEF LINE    REFERENCES
     0  1                          12          9
    50  2                          19         10
    57  3                          22         18      87
    37  10                         15         21
   307  20                         67         11
   406  30                         85         14
   133  40                         31         28
   147  41                         36         32
   177  42                         44         33
   155  43                         39         36
   171  44                         42         39
   213  45                         47         44
```

```
          FUNCTION ELEV        74/74   OPT=0 ROUND=*/ TRACE               FTN 4.6+420          09/02/77  13.54.00        PAGE     4

  STATEMENT LABELS                    DEF LINE   REFERENCES
     221  50                              49         29
     235  51                              54         50
     265  52                              62         51
     243  53                              57         54
     257  54                              60         57
     301  55                              65         62
     336  60                              73         70
     354  61                              77         74
     362  70                              79         71
     400  71                              83         80

  LOOPS  LABEL     INDEX        FROM-TO     LENGTH     PROPERTIES
     21  1       * I              9 12        11B          OPT       EXITS

  COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
        / /          4157                  0 SEGBEG (1)                1 SEGEND (1)                2 IEXTRAP(1)
                                           3 RUNS   (3)                6 RUNE   (3)                9 SPSTEP (1)
                                          10 SINPGL (1)               11 COSPGL (1)               12 TMP    (40)
                                          52 NTMP   (1)               53 NPGL   (1)               54 RELAREA(1)
                                          55 PGL    (40)              95 WHERE  (50)             145 IROW   (1)
                                         146 TER    (4000)          4146 TLSTART(2)             4148 TLSTOP (2)
                                        4150 FILLNET(1)             4151 CUTNET (1)             4152 CUTCOST(1)
                                        4153 FILCOST(1)             4154 ECOST  (1)             4155 ELIMHI (1)
         ACNT              1            4156 ELIMLO (1)
                                           0 KAPRCNT(1)

  STATISTICS
    PROGRAM LENGTH                   465B      309
    CM LABELED COMMON LENGTH           1B        1
    CM BLANK COMMON LENGTH         10075B     4157
```

```
SUBROUTINE SEARCH      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE      1

 1                  SUBROUTINE SEARCH(LROW,B.LESS.MORE)
                    COMMON SEGBEG.SEGEND.IEXTRAP.RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
                   1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50).IROW.TER(50.40.2),
                   2TLSTART(2),TLSTOP(2),FILLNET.CUTNET.CUTCOST.FILCOST.ECOST.ELIMHI,
 5                 3ELIMLO
                    KKNT=0
                    DO 10 K=1.2
                    IF(TER(LROW.K.1).NE.10E50) KKNT=KKNT+1
              10    CONTINUE
10                  IF(KKNT.NE.2) CALL ERROR(3)
                    DO 20 I=1.40
                    IF(TER(LROW.I.1).GT.B.AND.TER(LROW.I.1).NE. 10E50) GO TO 100
                    IF(TER(LROW.I.1).EQ.B) GO TO 300
              20    CONTINUE
15                  IF(IEXTRAP.NE.0) CALL ERROR(2)
                    DO 30 I=1.40
                    J=40-I+1
                    IF(TER(LROW.J.1).NE.10E50) GO TO 600
              30    CONTINUE
20                  CALL ERROR(3)
             100    IF(I.EQ.1) GO TO 200
             400    MORE=I
                    LESS=I-1
                    RETURN
25           200    IF(IEXTRAP.NE.0) CALL ERROR(2)
             500    MORE=2
                    LESS=1
                    RETURN
             300    IF(I.NE.1) GO TO 400
30                  GO TO 500
             600    I=J
                    GO TO 400
                    END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
    4  SEARCH          1          24         28

VARIABLES      SN  TYPE               RELOCATION
    0  B           REAL                  F.P.        REFS         12        13    DEFINED       1
   13  COSPGL      REAL                  / /         REFS          2
10070  CUTCOST     REAL                  / /         REFS          2
10067  CUTNET      REAL                  / /         REFS          2
10072  ECOST       REAL                  / /         REFS          2
10073  ELIMHI      REAL                  / /         REFS          2
10074  ELIMLO      REAL                  / /         REFS          2
10071  FILCOST     REAL                  / /         REFS          2
10066  FILLNET     REAL                  / /         REFS          2
  150  I           INTEGER                           REFS        2*12       13        17        21        22        23        29
                                                  DEFINED         11       16        31
    2  IEXTRAP     INTEGER               / /         REFS          2        15        25
  221  IROW        INTEGER               / /         REFS          2
```

```
      SUBROUTINE SEARCH     74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE              RELOCATION
   151  J          INTEGER                           REFS        18       31    DEFINED      17
   147  K          INTEGER                           REFS         8  DEFINED        7
   146  KKNT       INTEGER                           REFS         8       10    DEFINED       6         8
     0  LESS       INTEGER                 F.P.   DEFINED         1       23       27
     0  LROW       INTEGER                 F.P.      REFS         8     2*12       13      18   DEFINED          1
     0  MORE       INTEGER                 F.P.   DEFINED         1       22       26
    65  NPGL       INTEGER               / /         REFS         2
    64  NTMP       INTEGER               / /         REFS         2
    67  PGL        REAL         ARRAY    / /         REFS         2
    66  RELAREA    REAL                  / /         REFS         2
     6  RUNE       REAL         ARRAY    / /         REFS         2
     3  RUNS       REAL         ARRAY    / /         REFS         2
     0  SEGBEG     REAL                  / /         REFS         2
     1  SEGEND     REAL                  / /         REFS         2
    12  SINPGL     REAL                  / /         REFS         2
    11  SPSTEP     REAL                  / /         REFS         2
   222  TER        REAL         ARRAY    / /         REFS         2        8     2*12       13        18
 10062  TLSTART    REAL         ARRAY    / /         REFS         2
 10064  TLSTOP     REAL         ARRAY    / /         REFS         2
    14  TMP        REAL         ARRAY    / /         REFS         2
   137  WHERE      REAL         ARRAY    / /         REFS         2

EXTERNALS          TYPE   ARGS       REFERENCES
      ERROR                 1             10         15        20        25

STATEMENT LABELS                DEF LINE   REFERENCES
     0  10                          9          7
     0  20                         14         11
     0  30                         19         16
   103  100                        21         12
   115  200                        25         21
   127  300                        29         13
   106  400                        22         29        32
   121  500                        26         30
   133  600                        31         18

LOOPS  LABEL      INDEX       FROM-TO     LENGTH    PROPERTIES
   22  10         K             7 9         11B         OPT
   41  20       * I            11 14        17B         OPT       EXITS
   65  30       * I            16 19        13B         OPT       EXITS

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
     / /          4157                0 SEGBEG (1)                      1 SEGEND (1)                    2 IEXTRAP(1)
                                      3 RUNS   (3)                      6 RUNE   (3)                    9 SPSTEP (1)
                                     10 SINPGL (1)                     11 COSPGL (1)                   12 TMP    (40)
                                     52 NTMP   (1)                     53 NPGL   (1)                   54 RELAREA(1)
                                     55 PGL    (40)                    95 WHERE  (50)                 145 IROW   (1)
                                    146 TER    (4000)                4146 TLSTART(2)                 4148 TLSTOP (2)
                                   4150 FILLNET(1)                   4151 CUTNET (1)                 4152 CUTCOST(1)
                                   4153 FILCOST(1)                   4154 ECOST  (1)                 4155 ELIMHI (1)
                                   4156 ELIMLO (1)

STATISTICS
  PROGRAM LENGTH                    166B     118
  CM BLANK COMMON LENGTH          10075B    4157
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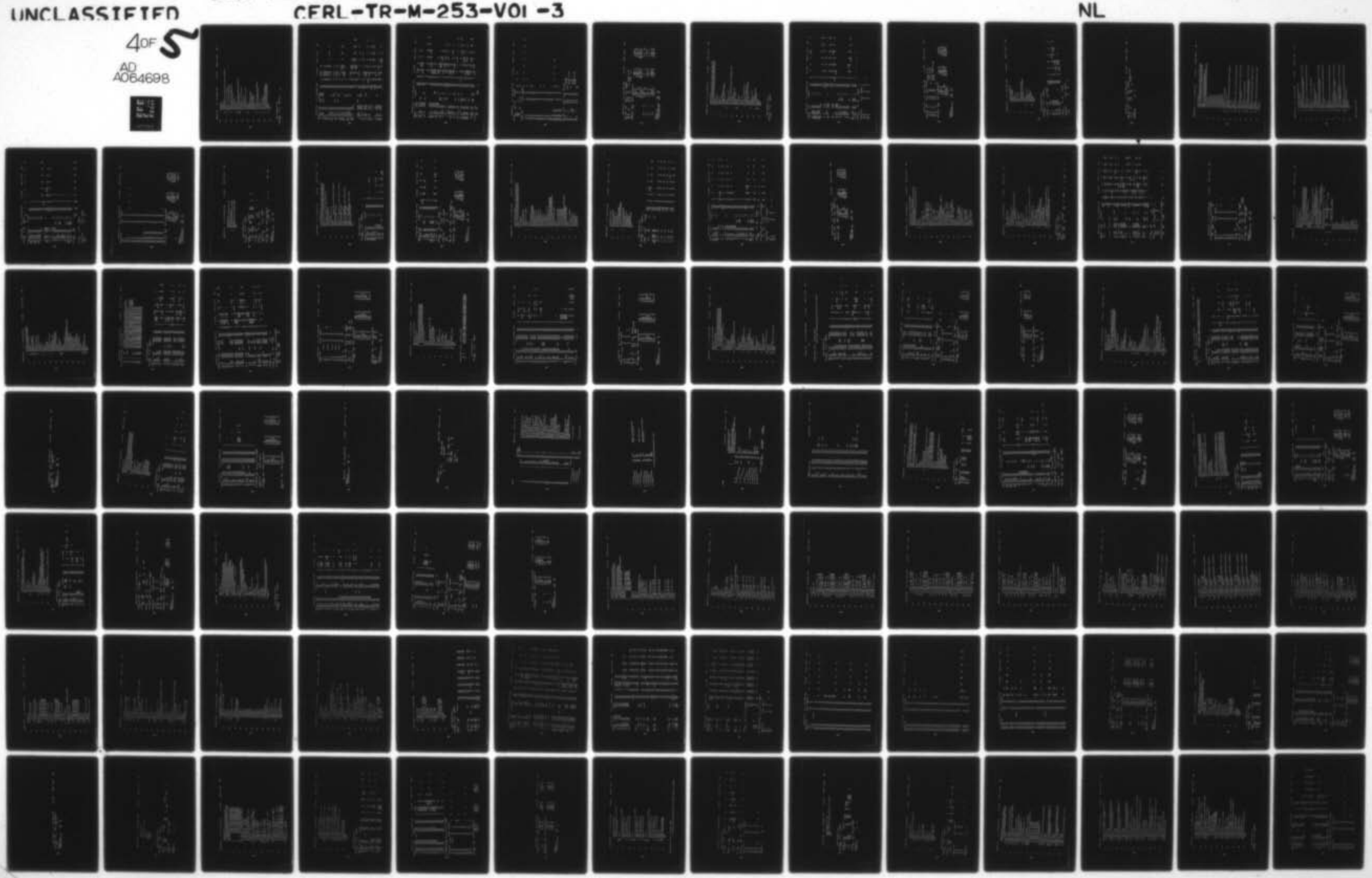
```
      SUBROUTINE INPUT
      DIMENSION LINE(8),PGLT(3,2),TMPT(3,2),TTER(3,2),KTEST(2),TREAD(4)
      COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
     1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
     2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
     3ELIMLO
      COMMON/PLOTS/IPLOT,IP,DIST(100),CVOL(100)
      COMMON /RL1/ K7,K4,EARTHWK,IDENT(3),FACTOR
      COMMON /TMPL/ IND,SWID,TWOCL,JACK
      COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
      COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
     1OT
      DATA KTEST/2,6/
      IPGL=IPGBRK=NOGO=ITD=ITMP=KCNT=JAKNT=JBKNT=0
      ELEVHI=ELEVLO=0.0
      IEXTRAP=2
      WRITE(4,498)
  498 FORMAT("1",//////////40X,27H***************************/40X,1H*,
     125X,1H*/40X,1H*,4X,17HEARTHWORK SUMMARY,4X,1H*/40X,1H*,25X,1H*/
     240X,27H***************************,////20X,10HINPUT DATA///)
1     READ(2,500) LINE
500   FORMAT(8A10)
      IF(EOF(2).NE.0)STOP
      WRITE(4,499)LINE
499   FORMAT(5X,8A10)
      IF(LINE(1).EQ.2HTL)GO TO 10
      IF(LINE(1).EQ.3HTOR)GO TO 70
      IF(LINE(1).EQ.2HTO)GO TO 20
      IF(LINE(1).EQ.7HPGLENDS)GO TO 30
      IF(LINE(1).EQ.5HAPRUN)GO TO 35
      IF(LINE(1).EQ.6HPGLBRK)GO TO 40
      IF(LINE(1).EQ.5HAPEND)GO TO 45
      IF(LINE(1).EQ.3HTMP)GO TO 50
      IF(LINE(1).EQ.4HELIM)GO TO 80
      IF(LINE(1).EQ.4HCOST)GO TO 90
      IF(LINE(1).EQ.3HRUN)GO TO 60
      WRITE(4,501)LINE
501   FORMAT(5X,*UNRECOGNIZABLE STATEMENT-*,8A10)
      NOGO=1
      GO TO 1
10    DECODE(70,401,LINE(2))TLSTART,TLSTOP
401   FORMAT(7F10.0)
  403 FORMAT(I1,9X,6F10.0)
      ITD=1
      IROW=0
      DO 11 I=1,50
      WHERE(I)=10E50
      DO 11 J=1,40
      DO 11 K=1,2
11    TER(I,J,K)=10E50
      GO TO 1
30    DECODE(70,405,LINE(2))RUNS,RUNE
      IPGL=1
      GO TO 1
 35   DECODE(70,403,LINE(2))JB,ZONSTEP(JB),APWID(JB)
      JBKNT=JBKNT+1
      GO TO 1
```

```
   40   DECODE(70,401,LINE(2))((PGLT(I,J),J=1,2),I=1,3)
        DO 41 I=1,3
        IF(LINE(I+1).EQ.1H ) GO TO 41
        IPGBRK=IPGBRK+1
        PGL(IPGBRK,1)=PGLT(I,1)
        PGL(IPGBRK,2)=PGLT(I,2)
   41   CONTINUE
        GO TO 1
    45  DECODE(70,403,LINE(2))JA,(APRSTR(JA,MAPR),MAPR=1,3),(APREND(JA,MAP
       1E),MAPE=1,3)
        JAKNT=JAKNT+1
        GO TO 1
   50   DECODE(70,401,LINE(2))((TMPT(I,J),J=1,2),I=1,3)
        DO 51 I=1,3
        IF(LINE(I+1).EQ.1H )GO TO 51
        ITMP=ITMP+1
        TMP(ITMP,1)=TMPT(I,1)
        TMP(ITMP,2)=TMPT(I,2)
   51   CONTINUE
        GO TO 1
   60   DECODE(70,402,LINE(2))TPSTEP,JEX,JPL,TSEGB,TSEGE
  402   FORMAT(F10.0,2A1,8X,2F10.0)
        IF(NOGO.EQ.1)STOP 1
        IF(JPL.EQ.1HP)IPLOT=1
        IF(TPSTEP.NE.0)SPSTEP=TPSTEP
        PSTEP=SPSTEP
        IF(JEX.EQ.1HX)IEXTRAP=0
        IF(JEX.EQ.1HE)IEXTRAP=1
        IF(JEX.EQ.1HQ)IEXTRAP=2
        SEGBEG=TSEGB
        SEGEND=TSEGE
        IF(JBKNT.EQ.JAKNT)GO TO 135
        CALL ERROR(24)
        EARTHWK=1.0
   135  NAPR=JBKNT
        IF(ITO.EQ.1)CALL SORTD
        IF(ITMP.NE.0)CALL SORTA(TMP,ITMP)
        IF(IPGBRK.NE.0)CALL SORTA(PGL,IPGBRK)
        IF(IPGL.EQ.0)RETURN
        HYP=SQRT((TLSTOP(1)-TLSTART(1))**2+(TLSTOP(2)-TLSTART(2))**2)
        SINA=(TLSTART(2)-TLSTOP(2))/HYP
        COSA=(TLSTOP(1)-TLSTART(1))/HYP
        A1=(RUNS(1)-TLSTART(1))*COSA-(RUNS(2)-TLSTART(2))*SINA
        B1=(RUNS(2)-TLSTART(2))*COSA+(RUNS(1)-TLSTART(1))*SINA
        A2=(RUNE(1)-TLSTART(1))*COSA-(RUNE(2)-TLSTART(2))*SINA
        B2=(RUNE(2)-TLSTART(2))*COSA+(RUNE(1)-TLSTART(1))*SINA
        RUNS(1)=A1
        RUNS(2)=B1
        RUNE(1)=A2
        RUNE(2)=B2
        HYPGL=SQRT((RUNE(1)-RUNS(1))**2+(RUNE(2)-RUNS(2))**2)
        COSPGL=(RUNE(2)-RUNS(2))/HYPGL
        SINPGL=(RUNE(1)-RUNS(1))/HYPGL
        ELIMHI=ELEVHI+DELHI
        ELIMLO=ELEVLO-DELLO
        IF(IPGBRK.NE.0)NPGL=IPGBRK
        IF(ITMP.EQ.0)RETURN
```

AD-A064 698 CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAI--ETC F/G 13/2
SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS. VOLUME III.--ETC(U)
JAN 79 E S LINDOW
UNCLASSIFIED CERL-TR-M-253-VOL-3 NL

4 OF 5

AD
A064698



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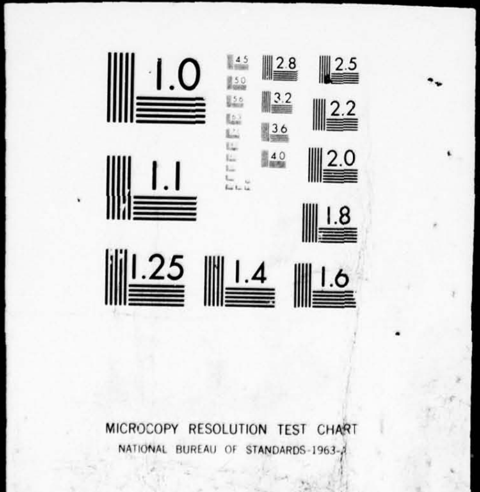
4 OF 5

AD
A064698


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
SUBROUTINE INPUT       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00          PAGE      3

115                       NTMP=ITMP
                          KTMP=NTMP-1
                          RELAREA=0.
                          DO 65 I=1,KTMP
                65        RELAREA=RELAREA+(TMP(I,2)-TMP(I+1,2))/2.*(TMP(I+1,1)-TMP(I,1))
120                       RETURN
                80        DECODE(70,401,LINE(2))DELHI,DELLO
                          GO TO 1
                       90 DECODE(70,401,LINE(2))CUTPRCE,FILPRCE
                          GO TO 1
125             70        DECODE(70,401,LINE(2))  (TREAD(M),M=1,4)
                          TREAD(3)=TREAD(3)-TREAD(4)
                          DO 71 I=1,3
                          TTER(I,1)=TREAD(I)
                71        TTER(I,2)=4H
130                       GO TO 72
                20        DECODE(70,405,LINE(2))((TTER(M,N),M=1,3),N=1,2)
                405       FORMAT(3F10.0,10X,3F10.0)
                72        DO 22 J=1,2
                          IF(LINE(KTEST(J)).EQ.1H )GO TO 22
135                       KCNT=KCNT+1
                          IF(IROW.EQ.0)GO TO 23
                          DO 21 I=1,IROW
                          IF(WHERE(I).EQ.TTER(1,J))GO TO 25
                21        CONTINUE
140             23        CONTINUE
                          IROW=IROW+1
                          IF(IROW.GT.50)CALL ERROR(19)
                          TER(IROW,1,1)=TTER(2,J)
                          TER(IROW,1,2)=TTER(3,J)
145                       WHERE(IROW)=TTER(1,J)
                          GO TO 24
                25        DO 26 K=1,40
                          IF(TER(I,K,1).EQ.TTER(2,J))CALL ERROR(20)
                          IF(TER(I,K,1).EQ.10E50) GO TO 27
150             26        CONTINUE
                          CALL ERROR(21)
                          GO TO 24
                27        TER(I,K,1)=TTER(2,J)
                          TER(I,K,2)=TTER(3,J)
155             24        IF(KCNT.EQ.1)ELEVHI=ELEVLO=TTER(3,J)
                          IF(ELEVHI.LT.TTER(3,J))ELEVHI=TTER(3,J)
                          IF(ELEVLO.GT.TTER(3,J))ELEVLO=TTER(3,J)
                22        CONTINUE
                          GO TO 1
160                       END


      SYMBOLIC REFERENCE MAP  (R=3)

  ENTRY POINTS      DEF LINE      REFERENCES
     2  INPUT          1            96          114          120
```

```
        SUBROUTINE INPUT       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE      4

   VARIABLES      SN  TYPE                 RELOCATION
      55  APREND      REAL          ARRAY    ZONES         REFS          11   DEFINED        66
      22  APRSTR      REAL          ARRAY    ZONES         REFS          11   DEFINED        66
     111  APTOT       REAL                   ZONES         REFS          11
      11  APWID       REAL          ARRAY    ZONES         REFS          11   DEFINED        55
    1252  A1          REAL                                 REFS         104   DEFINED       100
    1254  A2          REAL                                 REFS         106   DEFINED       102
    1253  B1          REAL                                 REFS         105   DEFINED       101
    1255  B2          REAL                                 REFS         107   DEFINED       103
    1251  COSA        REAL                                 REFS         100       101       102       103   DEFINED       99
      13  COSPGL      REAL                   / /           REFS           3   DEFINED       109
   10070  CUTCOST     REAL                   / /           REFS           3
   10067  CUTNET      REAL                   / /           REFS           3
       4  CUTPRCE     REAL                   TSV           REFS          10   DEFINED       123
     146  CVOL        REAL          ARRAY    PLOTS         REFS           7
    1257  DELHI       REAL                                 REFS         111   DEFINED       121
    1260  DELLO       REAL                                 REFS         112   DEFINED       121
       2  DIST        REAL          ARRAY    PLOTS         REFS           7
       2  EARTHWK     REAL                   RL1           REFS           8   DEFINED        91
   10072  ECOST       REAL                   / /           REFS           3
    1231  ELEVHI      REAL                                 REFS         111       156   DEFINED        15       155       156
    1232  ELEVLO      REAL                                 REFS         112       157   DEFINED        15       155       157
   10073  ELIMHI      REAL                   / /           REFS           3   DEFINED       111
   10074  ELIMLO      REAL                   / /           REFS           3   DEFINED       112
       1  ERCOST      REAL                   TSV           REFS          10
       6  FACTOR      REAL                   RL1           REFS           8
   10071  FILCOST     REAL                   / /           REFS           3
   10066  FILLNET     REAL                   / /           REFS           3
       3  FILPRCE     REAL                   TSV           REFS          10   DEFINED       123
    1247  HYP         REAL                                 REFS          98        99   DEFINED        97
    1256  HYPGL       REAL                                 REFS         109       110   DEFINED       108
    1233  I           INTEGER                              REFS          47        50        58      2*60        62        63        70
                                                           2*72          74        75     4*119     2*128       129       138       148
                                                            149         153       154   DEFINED        46        58        59        70
                                                             71         118       127       137
       3  IDENT       INTEGER       ARRAY    RL1           REFS           8
       2  IEXTRAP     INTEGER                / /           REFS           3   DEFINED        16        84        85        86
       0  IND         INTEGER                TMPL          REFS           9
       1  IP          INTEGER                PLOTS         REFS           7
    1222  IPGBRK      INTEGER                              REFS          61        62        63      2*95     2*113
                                                        DEFINED          14        61
    1221  IPGL        INTEGER                              REFS          96   DEFINED        14        53
       0  IPLOT       INTEGER                PLOTS         REFS           7   DEFINED        81
     221  IROW        INTEGER                / /           REFS           3       136       137       141       142       143       144
                                                            145     DEFINED        45       141
    1224  ITD         INTEGER                              REFS          93   DEFINED        14        44
    1225  ITMP        INTEGER                              REFS          73        74        75      2*94       114       115
                                                        DEFINED          14        73
    1234  J           INTEGER                              REFS          50        58        70       134       138       143       144
                                                            145         148       153       154       155     2*156     2*157
                                                        DEFINED          48        58        70       133
    1237  JA          INTEGER                              REFS        2*66   DEFINED        66
       3  JACK        INTEGER                TMPL          REFS           9
    1227  JAKNT       INTEGER                              REFS          68        89   DEFINED        14        68
    1236  JB          INTEGER                              REFS        2*55   DEFINED        55
    1230  JBKNT       INTEGER                              REFS          56        89        92   DEFINED        14        56
    1243  JEX         INTEGER                              REFS          84        85        86   DEFINED        78
```

```
      SUBROUTINE INPUT        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00        PAGE     5

 VARIABLES       SN  TYPE                RELOCATION
   1244  JPL         INTEGER                                REFS         81      DEFINED       78
   1235  K           INTEGER                                REFS         50        148        149        153        154
                                                         DEFINED         49        147
   1226  KCNT        INTEGER                                REFS        135        155    DEFINED         14        135
   1316  KTEST       INTEGER      ARRAY                     REFS          2        134    DEFINED         13
   1261  KTMP        INTEGER                                REFS        118    DEFINED        116
      1  K4          INTEGER               RL1              REFS          8
      0  K7          INTEGER               RL1              REFS          8
   1264  LINE        INTEGER      ARRAY                     REFS          2         24         26         27         28         29         30
                                                              31         32         33         34         35         36         37         41
                                                              52         55         58         60         66         70         72         78
                                                             121        123        125        131        134    DEFINED         21
   1262  M           INTEGER                                REFS        125        131    DEFINED        125        131
   1241  MAPE        INTEGER                                REFS         66    DEFINED         66
   1240  MAPR        INTEGER                                REFS         66    DEFINED         66
   1263  N           INTEGER                                REFS        131    DEFINED        131
    110  NAPR        INTEGER               ZONES            REFS         11    DEFINED         92
      5  NERTH       INTEGER               TSV              REFS         10
   1223  NOGO        INTEGER                                REFS         80    DEFINED         14         39
     65  NPGL        INTEGER               / /              REFS          3    DEFINED        113
     64  NTMP        INTEGER               / /              REFS          3        116    DEFINED        115
     67  PGL         REAL         ARRAY    / /              REFS          3         95    DEFINED         62         63
   1274  PGLT        REAL         ARRAY                     REFS          2         62         63    DEFINED         58
      2  PSTEP       REAL                  TSV              REFS         10    DEFINED         83
     66  RELAREA     REAL                  / /              REFS          3        119    DEFINED        117        119
      6  RUNE        REAL         ARRAY    / /              REFS          3      2*102      2*103      2*108        109        110
                                                         DEFINED         52        106        107
      3  RUNS        REAL         ARRAY    / /              REFS          3      2*100      2*101      2*108        109        110
                                                         DEFINED         52        104        105
      0  SEGBEG      REAL                  / /              REFS          3    DEFINED         87
      1  SEGEND      REAL                  / /              REFS          3    DEFINED         88
   1250  SINA        REAL                                   REFS        100        101        102        103    DEFINED         98
     12  SINPGL      REAL                  / /              REFS          3    DEFINED        110
     11  SPSTEP      REAL                  / /              REFS          3         83    DEFINED         82
      1  SWID        REAL                  TMPL             REFS          9
    222  TER         REAL         ARRAY    / /              REFS          3        148        149    DEFINED         50        143        144
                                                             153        154
      0  THCK        REAL                  TSV              REFS         10
  10062  TLSTART     REAL         ARRAY    / /              REFS          3       2*97         98         99      2*100      2*101      2*102
                                                           2*103    DEFINED         41
  10064  TLSTOP      REAL         ARRAY    / /              REFS          3       2*97         98         99    DEFINED         41
     14  TMP         REAL         ARRAY    / /              REFS          3         94      4*119    DEFINED         74         75
   1302  TMPT        REAL         ARRAY                     REFS          2         74         75    DEFINED         70
   1242  TPSTEP      REAL                                   REFS       2*82    DEFINED         78
   1320  TREAD       REAL         ARRAY                     REFS          2      2*126        128    DEFINED        125        126
   1245  TSEGB       REAL                                   REFS         87    DEFINED         78
   1246  TSEGE       REAL                                   REFS         88    DEFINED         78
   1310  TTER        REAL         ARRAY                     REFS          2        138        143        144        145        148        153
                                                             154        155      2*156      2*157    DEFINED        128        129        131
      2  TWOCL       REAL                  TMPL             REFS          9
    137  WHERE       REAL         ARRAY    / /              REFS          3        138    DEFINED         47        145
      0  ZONSTEP     REAL         ARRAY    ZONES            REFS         11    DEFINED         55

 FILE NAMES          MODE
         TAPE2       FMT                      READS           21
         TAPE4       FMT                     WRITES           17         24         37
```

```
          SUBROUTINE INPUT      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE    6

 EXTERNALS            TYPE    ARGS          REFERENCES
          EOF         REAL       1                23
          ERROR                  1                90       142       148       151
          SORTA                  2                94        95
          SORTD                  0                93
          SQRT        REAL       1 LIBRARY        97       108

 STATEMENT LABELS                     DEF LINE   REFERENCES
     17   1                                21        40        51        54        57        65        69        77       122       124
                                                    159
     76  10                                41        26
      0  11                                50        46        48        49
    602  20                               131        28
      0  21                               139       137
    736  22                               158       133       134
    631  23                               140       136
    716  24                               155       146       152
    655  25                               147       138
      0  26                               150       147
    702  27                               153       149
    134  30                                52        29
    142  35                                55        30
    155  40                                58        31
    216  41                                64        59        60
    223  45                                66        32
    260  50                                70        33
    321  51                                76        71        72
    326  60                                78        36
      0  65                               119       118
    562  70                               125        27
      0  71                               129       127
    605  72                               133       130
    552  80                               121        34
    556  90                               123        35
    375 135                                92        89
   1046 401         FMT                    42        41        58        70       121       123       125
   1132 402         FMT                    79        78
   1050 403         FMT                    43        55        66
   1163 405         FMT                   132        52       131
    770 498         FMT                    18        17
   1025 499         FMT                    25        24
   1017 500         FMT                    22        21
   1033 501         FMT                    38        37

 LOOPS  LABEL     INDEX       FROM-TO     LENGTH    PROPERTIES
   106   11      * I           46 50        24B                NOT INNER
   113   11      * J           48 50        14B                NOT INNER
   115   11        K           49 50         7B     INSTACK
   160           * I           58 58        15B                EXT REFS  NOT INNER
   161           * J           58 58        11B                EXT REFS
   201   41        I           59 64        20B        OPT
   226           * MAPR        66 66        11B                EXT REFS
   241           * MAPE        66 66        11B                EXT REFS
   263           * I           70 70        15B                EXT REFS  NOT INNER
   264           * J           70 70        11B                EXT REFS
   304   51        I           71 76        20B        OPT
   537   65        I          118 119       11B        OPT
```

```
       SUBROUTINE INPUT      74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE      7

LOOPS  LABEL    INDEX     FROM-TO    LENGTH     PROPERTIES
  571  71       I          127 129       78      INSTACK
  606  22     * J          133 158     133B                EXT REFS  NOT INNER
  620  21     * I          137 139      10B        OPT       EXITS
  656  26     * K          147 150      20B                EXT REFS    EXITS

COMMON BLOCKS     LENGTH     MEMBERS - BIAS NAME(LENGTH)
       / /          4157              0 SEGBEG (1)                  1 SEGEND (1)                  2 IEXTRAP(1)
                                      3 RUNS   (3)                  6 RUNE   (3)                  9 SPSTEP (1)
                                     10 SINPGL (1)                 11 COSPGL (1)                 12 TMP    (40)
                                     52 NTMP   (1)                 53 NPGL   (1)                 54 RELAREA(1)
                                     55 PGL    (40)                95 WHERE  (50)               145 IROW   (1)
                                    146 TER    (4000)            4146 TLSTART(2)               4148 TLSTOP (2)
                                   4150 FILLNET(1)               4151 CUTNET (1)               4152 CUTCOST(1)
                                   4153 FILCOST(1)               4154 ECOST  (1)               4155 ELIMHI (1)
                                   4156 ELIMLO (1)
       PLOTS         202              0 IPLOT  (1)                  1 IP     (1)                  2 DIST   (100)
                                    102 CVOL   (100)
       RL1             7              0 K7     (1)                  1 K4     (1)                  2 EARTHWK(1)
                                      3 IDENT  (3)                  6 FACTOR (1)
       TMPL            4              0 IND    (1)                  1 SWID   (1)                  2 TWOCL  (1)
                                      3 JACK   (1)
       TSV             6              0 THCK   (1)                  1 ERCOST (1)                  2 PSTEP  (1)
                                      3 FILPRCE(1)                  4 CUTPRCE(1)                  5 NERTH  (1)
       ZONES          74              0 ZONSTEP(9)                  9 APWID  (9)                 18 APRSTR (27)
                                     45 APREND (27)                72 NAPR   (1)                 73 APTOT  (1)

STATISTICS
  PROGRAM LENGTH              1326B      726
  CM LABELED COMMON LENGTH     445B      293
  CM BLANK COMMON LENGTH     10075B     4157
```

```
SUBROUTINE SORTD       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE     1

                 SUBROUTINE SORTD
                 COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
                1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
                2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
                3ELIMLO
                 KROW=IROW-1
                 DO 50 I=1,KROW
                 KK=I+1
                 BIG=WHERE(I)
                 IBIG=I
                 DO 40 J=KK,IROW
                 IF(WHERE(J).GT.BIG)GO TO 40
                 IF(WHERE(J).EQ.BIG)CALL ERROR(25)
                 BIG=WHERE(J)
                 IBIG=J
          40     CONTINUE
                 IF(IBIG.EQ.I)GO TO 50
                 DO 42 J=1,40
                 IF(TER(I,J,1).EQ.10E50.AND.TER(IBIG,J,1).EQ.10E50)GO TO 50
                 DO 42 KK=1,2
                 TEM=TER(I,J,KK)
                 TER(I,J,KK)=TER(IBIG,J,KK)
                 TER(IBIG,J,KK)=TEM
          42     CONTINUE
          50     CONTINUE
                 DO 70 I=1,IROW
                 DO 68 J=1,39
                 KK=J+1
                 BIG=TER(I,J,1)
                 IBIG=J
                 IF(TER(I,J,1).EQ.10E50)GO TO 70
                 DO 65 K=KK,40
                 IF(TER(I,K,1).GT.BIG)GO TO 65
                 IF(TER(I,K,1).EQ.BIG)CALL ERROR(26)
                 BIG=TER(I,K,1)
                 IBIG=K
          65     CONTINUE
                 IF(IBIG.EQ.J)GO TO 68
                 DO 67 KK=1,2
                 TEM=TER(I,J,KK)
                 TER(I,J,KK)=TER(I,IBIG,KK)
          67     TER(I,IBIG,KK)=TEM
          68     CONTINUE
          70     CONTINUE
                 RETURN
                 END


     SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS     DEF LINE     REFERENCES
    2  SORTD          1           45
```

```
       SUBROUTINE SORTD      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     2
VARIABLES     SN  TYPE           RELOCATION
  243  BIG       REAL                             REFS        12        13        33        34   DEFINED         9        14
                                                    29        35
   13  COSPGL    REAL                / /          REFS         2
10070  CUTCOST   REAL                / /          REFS         2
10067  CUTNET    REAL                / /          REFS         2
10072  ECOST     REAL                / /          REFS         2
10073  ELIMHI    REAL                / /          REFS         2
10074  ELIMLO    REAL                / /          REFS         2
10071  FILCOST   REAL                / /          REFS         2
10066  FILLNET   REAL                / /          REFS         2
  241  I         INTEGER                          REFS         8         9        10        17        19        21        22
                                                    29        31        33        34        35        40      2*41        42
                                               DEFINED         7        26
  244  IBIG      INTEGER                          REFS        17        19        22        23        38        41        42
                                               DEFINED        10        15        30        36
    2  IEXTRAP   INTEGER             / /          REFS         2
  221  IROW      INTEGER             / /          REFS         2         6        11        26
  245  J         INTEGER                          REFS        12        13        14        15      2*19        21      2*22
                                                    23        28        29        30        31        38        40        41
                                               DEFINED        11        18        27
  247  K         INTEGER                          REFS        33        34        35        36   DEFINED        32
  242  KK        INTEGER                          REFS        11        21      2*22        23        32        40      2*41
                                                    42   DEFINED         8        20        28        39
  240  KROW      INTEGER                          REFS         7   DEFINED         6
   65  NPGL      INTEGER             / /          REFS         2
   64  NTMP      INTEGER             / /          REFS         2
   67  PGL       REAL       ARRAY    / /          REFS         2
   66  RELAREA   REAL                / /          REFS         2
    6  RUNE      REAL       ARRAY    / /          REFS         2
    3  RUNS      REAL       ARRAY    / /          REFS         2
    0  SEGREG    REAL                / /          REFS         2
    1  SEGEND    REAL                / /          REFS         2
   12  SINPGL    REAL                / /          REFS         2
   11  SPSTEP    REAL                / /          REFS         2
  246  TEM       REAL                             REFS        23        42   DEFINED        21        40
  222  TER       REAL       ARRAY    / /          REFS         2      2*19        21        22        29        31        33
                                                    34        35        40        41   DEFINED        22        23        41
                                                    42
10062  TLSTART   REAL       ARRAY    / /          REFS         2
10064  TLSTOP    REAL       ARRAY    / /          REFS         2
   14  TMP       REAL       ARRAY    / /          REFS         2
  137  WHERE     REAL       ARRAY    / /          REFS         2         9        12        13        14

EXTERNALS          TYPE   ARGS       REFERENCES
       ERROR                1             13        34

STATEMENT LABELS             DEF LINE   REFERENCES
   40  40                       16        11        12
    0  42                       24        18        20
  113  50                       25         7        17        19
  164  65                       37        32        33
    0  67                       42        39
  221  68                       43        27        38
  225  70                       44        26        31
```

```
     SUBROUTINE SORTD       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00       PAGE      3

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   10   50     * I            7 25       106B                   EXT REFS  NOT INNER
   22   40     * J           11 16        21B                   EXT REFS
   50   42     * J           18 24        42B                     EXITS   NOT INNER
   62   42       KK          20 24        25B           OPT
  120   70     * I           26 44       110B                   EXT REFS  NOT INNER
  122   68     * J           27 43       102B                   EXT REFS    EXITS    NOT INNER
  142   65     * K           32 37        25B                   EXT REFS
  174   67       KK          39 42        24B           OPT

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
     / /          4157                0 SEGBEG (1)                    1 SEGEND (1)                     2 IEXTRAP(1)
                                      3 RUNS   (3)                    6 RUNE   (3)                     9 SPSTEP (1)
                                     10 SINPGL (1)                   11 COSPGL (1)                    12 TMP    (40)
                                     52 NTMP   (1)                   53 NPGL   (1)                    54 RELAREA(1)
                                     55 PGL    (40)                  95 WHERE  (50)                  145 IROW   (1)
                                    146 TER    (4000)              4146 TLSTART(2)                  4148 TLSTOP (2)
                                   4150 FILLNET(1)                 4151 CUTNET (1)                  4152 CUTCOST(1)
                                   4153 FILCOST(1)                 4154 ECOST  (1)                  4155 ELIMHI (1)
                                   4156 ELIMLO (1)

STATISTICS
  PROGRAM LENGTH              250B     168
  CM BLANK COMMON LENGTH    10075B    4157
```

```
      SUBROUTINE SORTA       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00         PAGE      1

    1                     SUBROUTINE SORTA(ARR.NUM)
                          DIMENSION ARR(20.2)
                          IF(NUM.LE.1)RETURN
                          LIM=NUM
    5                     LIM1=LIM-1
                          DO 20 I=1.LIM1
                          K=I+1
                          SMALL=ARR(I.1)
                          IS=I
   10                     DO 18 J=K.LIM
                          IF(SMALL.LT.ARR(J.1))GO TO 18
                          IF(SMALL.EQ.ARR(J.1))CALL ERROR(27)
                          SMALL=ARR(J.1)
                          IS=J
   15              18     CONTINUE
                          IF(IS.EQ.I)GO TO 20
                          DO 19 K=1.2
                          TEM=ARR(I.K)
                          ARR(I.K)=ARR(IS.K)
   20              19     APR(IS.K)=TEM
                   20     CONTINUE
                          RETURN
                          END


      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
    4  SORTA            1             3          22

 VARIABLES       SN  TYPE             RELOCATION
    0  ARR           REAL        ARRAY     F.P.         REFS        2         8        11        12        13        18        19
                                                     DEFINED        1        19        20
  123  I             INTEGER                            REFS        7         8         9        16        18        19
                                                     DEFINED        6
  126  IS            INTEGER                            REFS       16        19        20   DEFINED         9        14
  127  J             INTEGER                            REFS       11        12        13        14   DEFINED        10
  124  K             INTEGER                            REFS       10        18      2*19        20   DEFINED         7        17
  121  LIM           INTEGER                            REFS        5        10   DEFINED         4
  122  LIM1          INTEGER                            REFS        6   DEFINED         5
    0  NUM           INTEGER              F.P.          REFS        3         4   DEFINED         1
  125  SMALL         REAL                               REFS       11        12   DEFINED         8        13
  130  TEM           REAL                               REFS       20   DEFINED        18

 EXTERNALS            TYPE    ARGS        REFERENCES
      ERROR                     1             12

 STATEMENT LABELS               DEF LINE   REFERENCES
   60  18                           15         10         11
    0  19                           20         17
  111  20                           21          6         16
```

```
     SUBROUTINE SORTA       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE     2

LOOPS  LABEL     INDEX      FROM-TO     LENGTH    PROPERTIES
   30  20      * I             6 21        64B              EXT REFS  NOT INNER
   42  18      * J            10 15        21B              EXT REFS
   70  19        K            17 20        20B        OPT

STATISTICS
  PROGRAM LENGTH                  144B     100
```

```
            SUBROUTINE ERROR(I)
            COMMON SEGBEG.SEGEND.IEXTRAP.RUNS(3).RUNE(3).SPSTEP.SINPGL.COSPGL.
           1TMP(20.2).NTMP.NPGL.RELAREA.PGL(20.2).WHERE(50).IROW.TER(50.40.2).
           2TLSTART(2).TLSTOP(2).FILLNET.CUTNET.CUTCOST.FILCOST.ECOST.ELIMHI.
           3ELIMLO
            COMMON /TSV/THCK.ERCOST.PSTEP.FILPRCE.CUTPRCE.NERTH
            NAMELIST/BUG/ SEGBEG.SEGEND.IEXTRAP.RUNS.RUNE.PSTEP.SPSTEP.
           1 SINPGL.COSPGL.NTMP.NPGL.RELAREA.IROW,TLSTART,TLSTOP,TMP,PGL,WHERE
            IF(I.LT.1)GO TO 1
            IF(I.LT.4)GO TO 2
            IF(I.EQ.6)GO TO 3
            IF(I.EQ.19)GO TO 4
            IF(I.EQ.20)GO TO 5
            IF(I.EQ.21)GO TO 6
            IF(I.EQ.24)GO TO 15
            IF(I.EQ.25)GO TO 7
            IF(I.EQ.26)GO TO 8
            IF(I.EQ.27)GO TO 9
            IF(I.EQ.31)GO TO 13
            IF(I.EQ.32)GO TO 14
            IF(I.EQ.98)GO TO 16
            IF(I.EQ.99)GO TO 19
            IF(I.EQ.100)GO TO 20
      1     WRITE(4.100)
    100     FORMAT(5X.*INVALID ERROR CODE*)
            GO TO 10
      2     IF(IEXTRAP.EQ.1)GO TO 12
            WRITE(4.101)
    101     FORMAT(5X.*A POINT ON THE TEMPLATE LIES OUTSIDE OF THE RANGE OF TE
           1RRAIN DATA*)
            STOP
     12     IXCNT=IXCNT+1
            RETURN
      3     WRITE(4.103)
    103     FORMAT(5X.*DISPLAY SEGMENT IS OUT OF RANGE OF THE PROFILE GRADE LI
           1NE*)
            GO TO 10
      4     WRITE(4.104)
    104     FORMAT(5X.*-TERRAIN DATA OVERFLOW-*/5X.*ONLY  50 ROWS MAY BE ENTER
           1ED--EXECUTION CONTINUING*)
            RETURN
      5     WRITE(4.105)
    105     FORMAT(5X.*DUPLICATE TERRAIN DATA FOUND*)
            GO TO 10
      6     WRITE(4.106)
    106     FORMAT(5X.*TERRAIN DATA OVERFLOW-*/5X.*ONLY  40 POINTS MAY BE CONT
           1AINED IN A SINGLE ROW--EXECUTION CONTINUING*)
            RETURN
      7     WRITE(4.107)
    107     FORMAT(5X.*-SYSTEM ERROR-*/5X.*TWO TERRAIN DATA ROWS AT THE SAME
           1POSITION*)
            GO TO 10
      8     WRITE(4.108)
    108     FORMAT(5X.*-SYSTEM ERROR-*/5X.*DUPLICATE POINTS WITHIN A TERRAIN
           1ROW*)
            GO TO 10
     13     LIMHI=LIMHI+1
```

```
      IF(LIMHI.EQ.1.AND.LIMLO.EQ.0)GO TO 53
   54 IF(LIMHI.EQ.11)GO TO 51
      IF (LIMHI.GT.11)RETURN
      WRITE(4,111)
  111 FORMAT(5X,*COMPUTED ELEVATION HAS REACHED HIGHEST LIMIT, ELEVATION
     1 HAS BEEN REASSIGNED, EXECUTION CONTINUING*)
      RETURN
   51 WRITE(4,113)
  113 FORMAT(5X,"HIGHEST LIMIT WARNING MESSAGE NOW TERMINATED,FINAL COUN
     1T WILL FOLLOW")
      RETURN
   53 WRITE(4,116)
  116 FORMAT("1",///"  ELEVATION LIMIT VIOLATION"//)
      GO TO 54
   14 LIMLO=LIMLO+1
      IF(LIMLO.EQ.1.AND.LIMHI.EQ.0)GO TO 55
   56 IF(LIMLO.EQ.11)GO TO 52
      IF (LIMLO.GT.11)RETURN
      WRITE(4,112)
  112 FORMAT(5X,*COMPUTED ELEVATION HAS REACHED LOWEST LIMIT, ELEVATION
     1HAS BEEN REASSIGNED, EXECUTION CONTINUING*)
      RETURN
   52 WRITE(4,114)
  114 FORMAT(5X," LOWEST LIMIT WARNING MESSAGE NOW TERMINATED,FINAL COUN
     1T WILL FOLLOW")
      RETURN
   55 WRITE(4,116)
      GO TO 56
   15 WRITE(4,102)
  102 FORMAT(5X,*APPROACH DATA CARD MISSING TO INPUT,EARTHWORK VALUE CHA
     1NGED TO 1*)
      RETURN
   16 WRITE(4,115)LIMHI,LIMLO
  115 FORMAT(5X,"HIGHEST ELEVATION LIMIT REACHED ",I4," TIMES.",10X,"LOW
     1EST ELEVATION LIMIT REACHED ",I4," TIMES.")
   19 IXCNT=LIMLO=LIMHI=0
      RETURN
   20 IF(IXCNT.NE.0)WRITE(4,120)IXCNT
  120 FORMAT(5X,*EXTRAPOLATION HAS OCCURRED*/5X,I10,* INDIVIDUAL EXTRAPO
     1LATIONS HAVE OCCURED IN THIS RUN*)
      RETURN
    9 WRITE(4,109)
  109 FORMAT(5X,*DUPLICATE POINT WITHIN TEMPLATE OR PROFILE GRADE LINE*)
   10 WRITE(4,110)I
  110 FORMAT(5X,*--ERROR NUMBER--*,I5)
      WRITE(4,BUG)
      STOP 4171
      END
```

SYMBOLIC REFERENCE MAP (R=3)

```
       SUBROUTINE ERROR      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     3

ENTRY POINTS     DEF LINE     REFERENCES
    4  ERROR           1         33        41        48        60        64        68        75        79        83        89
                                 94        98

VARIABLES     SN  TYPE           RELOCATION
   13  COSPGL    REAL                / /          REFS          2         7
10070  CUTCOST   REAL                / /          REFS          2
10067  CUTNET    REAL                / /          REFS          2
    4  CUTPRCE   REAL                TSV          REFS          6
10072  ECOST     REAL                / /          REFS          2
10073  ELIMHI    REAL                / /          REFS          2
10074  ELIMLO    REAL                / /          REFS          2
    1  ERCOST    REAL                TSV          REFS          6
10071  FILCOST   REAL                / /          REFS          2
10066  FILLNET   REAL                / /          REFS          2
    3  FILPRCE   REAL                TSV          REFS          6
    0  I         INTEGER              F.P.        REFS          9        10        11        12        13        14        15
                                                     16        17        18        19        20        21        22        23
                                                    101   DEFINED         1
    2  IEXTRAP   INTEGER             / /          REFS          2         7        27
  221  IROW      INTEGER             / /          REFS          2         7
  654  IXCNT     INTEGER                          REFS         32      2*95   DEFINED        32        93
  655  LIMHI     INTEGER                          REFS         57        58        59        60        73        90
                                                DEFINED        57        93
  656  LIMLO     INTEGER                          REFS         58        72        73        74        75        90
                                                DEFINED        72        93
    5  NERTH     INTEGER             TSV          REFS          6
   65  NPGL      INTEGER             / /          REFS          2         7
   64  NTMP      INTEGER             / /          REFS          2         7
   67  PGL       REAL       ARRAY    / /          REFS          2         7
    2  PSTEP     REAL                TSV          REFS          6         7
   66  RELAREA   REAL                / /          REFS          2         7
    6  RUNE      REAL       ARRAY    / /          REFS          2         7
    3  RUNS      REAL       ARRAY    / /          REFS          2         7
    0  SEGBEG    REAL                / /          REFS          2         7
    1  SEGEND    REAL                / /          REFS          2         7
   12  SINPGL    REAL                / /          REFS          2         7
   11  SPSTEP    REAL                / /          REFS          2         7
  222  TER       REAL       ARRAY    / /          REFS          2
    0  THCK      REAL                TSV          REFS          6
10062  TLSTART   REAL       ARRAY    / /          REFS          2         7
10064  TLSTOP    REAL       ARRAY    / /          REFS          2         7
   14  TMP       REAL       ARRAY    / /          REFS          2         7
  137  WHERE     REAL       ARRAY    / /          REFS          2         7

FILE NAMES        MODE
       TAPE4     MIXED                 WRITES        24        28        34        38        42        45        49        53
                                           61        65        69        76        80        84        86        90        95
                                           99       101       103

NAMELISTS        DEF LINE     REFERENCES
       BUG             7       103

STATEMENT LABELS             DEF LINE   REFERENCES
   64  1                        24         9
   70  2                        27        10
  103  3                        34        11
```

```
         SUBROUTINE ERROR       74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420         09/02/77  13.54.00        PAGE     4

STATEMENT LABELS                DEF LINE   REFERENCES
   107  4                           38        12
   113  5                           42        13
   117  6                           45        14
   123  7                           49        16
   127  8                           53        17
   235  9                           99        18
   240  10                         101        26        37        44        52        56
    77  12                          32        27
   133  13                          57        19
   164  14                          72        20
   215  15                          86        15
   221  16                          90        21
   224  19                          93        22
   230  20                          95        23
   154  51                          65        59
   205  52                          80        74
   160  53                          69        58
   143  54                          59        71
   211  55                          84        73
   174  56                          74        85
   321  100     FMT                 25        24
   330  101     FMT                 29        28
   554  102     FMT                 87        86
   344  103     FMT                 35        34
   357  104     FMT                 39        38
   374  105     FMT                 43        42
   404  106     FMT                 46        45
   423  107     FMT                 50        49
   437  108     FMT                 54        53
   630  109     FMT                100        99
   644  110     FMT                102       101
   452  111     FMT                 62        61
   516  112     FMT                 77        76
   471  113     FMT                 66        65
   535  114     FMT                 81        80
   572  115     FMT                 91        90
   505  116     FMT                 70        69        84
   612  120     FMT                 96        95

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
     / /         4157                  0 SEGBEG (1)                1 SEGEND (1)                2 IEXTRAP(1)
                                       3 RUNS   (3)                6 RUNE   (3)                9 SPSTEP (1)
                                      10 SINPGL (1)               11 COSPGL (1)               12 TMP    (40)
                                      52 NTMP   (1)               53 NPGL   (1)               54 RELAREA(1)
                                      55 PGL    (40)              95 WHERE  (50)             145 IROW   (1)
                                     146 TER    (4000)          4146 TLSTART(2)             4148 TLSTOP (2)
                                    4150 FILLNET(1)             4151 CUTNET (1)             4152 CUTCOST(1)
                                    4153 FILCOST(1)             4154 ECOST  (1)             4155 ELIMHI (1)
                                    4156 ELIMLO (1)
     TSV            6                  0 THCK   (1)                1 ERCOST (1)                2 PSTEP  (1)
                                       3 FILPRCE(1)                4 CUTPRCE(1)                5 NERTH  (1)

STATISTICS
  PROGRAM LENGTH                 661B     433
  CM LABELED COMMON LENGTH         6B       6
  CM BLANK COMMON LENGTH       10075B    4157
```

```
SUBROUTINE LPLOT      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE      1

1                 SUBROUTINE LPLOT
                  COMMON/PLOTS/IPLOT,IP,DIST(100),CVOL(100)
                  WRITE(11,10)
              10  FORMAT(1H1,*MASS DIAGRAM*//)
5                 CALL STPLT1(1,DIST,CVOL,IP,1H*,6,6HVOLUME)
                  WRITE(11,11)
              11  FORMAT(20X,*DISTANCE FROM SEGMENT ORIGIN*)
                  RETURN
                  END


   SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    2  LPLOT         1            8

VARIABLES     SN  TYPE            RELOCATION
  146  CVOL        REAL       ARRAY    PLOTS        REFS         2         5
    2  DIST        REAL       ARRAY    PLOTS        REFS         2         5
    1  IP          INTEGER             PLOTS        REFS         2         5
    0  IPLOT       INTEGER             PLOTS        REFS         2

FILE NAMES        MODE
       TAPE11     FMT                    WRITES        3         6

EXTERNALS            TYPE    ARGS        REFERENCES
       STPLT1                 7               5

STATEMENT LABELS                 DEF LINE   REFERENCES
   25  10        FMT                 4          3
   34  11        FMT                 7          6

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       PLOTS       202                 0 IPLOT   (1)             1 IP      (1)                 2 DIST    (100)
                                     102 CVOL    (100)

STATISTICS
  PROGRAM LENGTH                 47B       39
  CM LABELED COMMON LENGTH      312B      202
```

```
FUNCTION TMPAREA     74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE      1

  1                  FUNCTION TMPAREA(RELDST)
                     COMMON SEGBEG.SEGEND.IEXTRAP.RUNS(3).RUNE(3).SPSTEP.SINPGL.COSPGL.
                    1TMP(20.2).NTMP.NPGL.RELAREA.PGL(20.2).WHERE(50).IROW.TER(50.40.2).
                    2TLSTART(2).TLSTOP(2).FILLNET.CUTNET.CUTCOST.FILCOST.ECOST.ELIMHI.
  5                 3ELIMLO
                     DIST=SQRT((RUNE(1)-RUNS(1))**2+(RUNE(2)-RUNS(2))**2)
                     QAREA=TMP(NTMP.1)-TMP(1.1)
                     IF(RELDST.GT.DIST)RELDST=DIST
                     IF(NPGL.EQ.0)GO TO 4
 10                  DO 1 I=1.NPGL
                     IF(RELDST.LT.PGL(I.1))GO TO 2
              1      CONTINUE
                     TMPAREA=         (RELDST-PGL(NPGL.1))/(DIST-PGL(NPGL.1))*(RUNE(3)-
                    1PGL(NPGL.2))+PGL(NPGL.2)
 15                  TMPAREA=TMPAREA*QAREA   +RELAREA
                     RETURN
              2      IF(I.EQ.1)GO TO 3
                     TMPAREA=         (RELDST-PGL(I-1.1))/(PGL(I.1)-PGL(I-1.1))*(PGL(I.2
                    1)-PGL(I-1.2))+PGL(I-1.2)
 20                  TMPAREA=TMPAREA*QAREA   +RELAREA
                     RETURN
              3      IF(RELDST.LT.0.)CALL ERROR(6)
                     TMPAREA=         RELDST/PGL(1.1) *(PGL(1.2)-RUNS(3))+RUNS(3)
                     TMPAREA=TMPAREA*QAREA   +RELAREA
 25                  RETURN
              4      IF(RELDST.LT.0.)CALL ERROR(6)
                     TMPAREA=         RELDST/DIST*(RUNE(3)-RUNS(3))+RUNS(3)
                     TMPAREA=TMPAREA*QAREA   +RELAREA
                     RETURN
 30                  END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
    5  TMPAREA         1          16         21          25          29

VARIABLES      SN  TYPE              RELOCATION
   13  COSPGL     REAL                   / /          REFS         2
10070  CUTCOST    REAL                   / /          REFS         2
10067  CUTNET     REAL                   / /          REFS         2
  141  DIST       REAL                                REFS       2*8         13          27    DEFINED          6
10072  ECOST      REAL                   / /          REFS         2
10073  ELIMHI     REAL                   / /          REFS         2
10074  ELIMLO     REAL                   / /          REFS         2
10071  FILCOST    REAL                   / /          REFS         2
10066  FILLNET    REAL                   / /          REFS         2
  143  I          INTEGER                             REFS        11         17        6*18    DEFINED         10
    2  IEXTRAP    INTEGER                / /          REFS         2
  221  IROW       INTEGER                / /          REFS         2
   65  NPGL       INTEGER                / /          REFS         2          9          10        4*13
   64  NTMP       INTEGER                / /          REFS         2          7
   67  PGL        REAL        ARRAY      / /          REFS         2         11        4*13        6*18       2*23
  142  QAREA      REAL                                REFS        15         20          24          28    DEFINED          7
```

```
     FUNCTION TMPAREA     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      2

VARIABLES    SN  TYPE              RELOCATION
   66  RELAREA   REAL                  / /          REFS          2      15      20      24      28
    0  RELDST    REAL                   F.P.        REFS          8      11      13      18      22      23      26
                                                      27    DEFINED       1       8
    6  RUNE      REAL      ARRAY       / /          REFS          2     2*6      13      27
    3  RUNS      REAL      ARRAY       / /          REFS          2     2*6    2*23    2*27
    0  SEGBEG    REAL                  / /          REFS          2
    1  SEGEND    REAL                  / /          REFS          2
   12  SINPGL    REAL                  / /          REFS          2
   11  SPSTEP    REAL                  / /          REFS          2
  222  TER       REAL      ARRAY       / /          REFS          2
10062  TLSTART   REAL      ARRAY       / /          REFS          2
10064  TLSTOP    REAL      ARRAY       / /          REFS          2
   14  TMP       REAL      ARRAY       / /          REFS          2     2*7
  140  TMPAREA   REAL                               REFS         15      20      24      28   DEFINED      13      15
                                                      18         20      23      24      27      28
  137  WHERE     REAL      ARRAY       / /          REFS          2

EXTERNALS           TYPE    ARGS          REFERENCES
    ERROR                     1               22       26
    SQRT            REAL      1 LIBRARY        6

STATEMENT LABELS                   DEF LINE    REFERENCES
    0  1                              12          10
   63  2                              17          11
  101  3                              22          17
  116  4                              26           9

LOOPS  LABEL    INDEX      FROM-TO     LENGTH     PROPERTIES
   41  1       * I          10 12          6B      INSTACK     EXITS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
    / /          4157                0 SEGBEG (1)                 1 SEGEND (1)                 2 IEXTRAP(1)
                                     3 RUNS   (3)                 6 RUNE   (3)                 9 SPSTEP (1)
                                    10 SINPGL (1)                11 COSPGL (1)                12 TMP    (40)
                                    52 NTMP   (1)                53 NPGL   (1)                54 RELAREA(1)
                                    55 PGL    (40)               95 WHERE  (50)              145 IROW   (1)
                                   146 TER    (4000)           4146 TLSTART(2)              4148 TLSTOP (2)
                                  4150 FILLNET(1)              4151 CUTNET (1)              4152 CUTCOST(1)
                                  4153 FILCOST(1)              4154 ECOST  (1)              4155 ELIMHI (1)
                                  4156 ELIMLO (1)

STATISTICS
  PROGRAM LENGTH                  146B     102
  CM BLANK COMMON LENGTH        10075B    4157
```

```
SUBROUTINE NXTPNT      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE      1

      SUBROUTINE NXTPNT(A.B,STEP)
      COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
     1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
     2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
     3ELIMLO
      DATA STPMIN/1.0/
      DO 1 I=1,IROW
      IF(WHERE(I).GT.A)GO TO 2
      IF(WHERE(I).EQ.A)GO TO 20
    1 CONTINUE
      IF(IEXTRAP.NE.0)CALL ERROR(1)
      GO TO 30
    2 IBEG=I-1
      IEND=I
      IF(IBEG.EQ.0)GO TO 10
      CALL SEARCH(IBEG,B,LESSB,MOREB)
      CALL SEARCH(IEND,B,LESSE,MOREE)
      DIST1=B-TER(IBEG,LESSB,1)
      DIST1=ABS(DIST1)
      DIST2=B-TER(IEND,LESSE,1)
      DIST2=ABS(DIST2)
      DIST3=TER(IEND,MOREE,1)-B
      DIST3=ABS(DIST3)
      DIST4=TER(IBEG,MOREB,1)-B
      DIST4=ABS(DIST4)
      DIST5=WHERE(IEND)-A
      DIST5=ABS(DIST5)
      DIST6=A-WHERE(IBEG)
      DIST6=ABS(DIST6)
      IF(ABS(COSPGL) .GT.0.1)GO TO 4
      AA=AMIN1(DIST5,DIST6)
      IF(AA.EQ.DIST5)DIST5=WHERE(IEND)-WHERE(IBEG)
      IF(AA.EQ.DIST6)DIST6=WHERE(IEND)-WHERE(IBEG)
    4 DIST=AMIN1(DIST1,DIST2,DIST3,DIST4,DIST5,DIST6)
      IF(DIST.EQ.0.)GO TO 3
      IF(DIST.LT.STPMIN)DIST=STPMIN
      STEP=DIST
      RETURN
    3 IF(DIST1.EQ.0 )DIST1=10E50
      IF(DIST2.EQ.0.)DIST2=10E50
      IF(DIST3.EQ.0.)DIST3=10E50
      IF(DIST4.EQ.0.)DIST4=10E50
      IF(DIST5.EQ.0.)DIST5=10E50
      IF(DIST6.EQ.0.)DIST6=10E50
      DIST=AMIN1(DIST1,DIST2,DIST3,DIST4,DIST5,DIST6)
      IF(DIST.EQ.10E50)CALL ERROR(10)
      IF(DIST.LT.STPMIN)DIST=STPMIN
      STEP=DIST
      RETURN
   10 CALL SEARCH(1,B,LESS,MORE)
      CALL ERROR(2)
      DIST1=B-TER(1,LESS,1)
      DIST1=ABS(DIST1)
      DIST2=TER(1,MORE,1)-B
      DIST2=ABS(DIST2)
      DIST3=WHERE(1)-A
      DIST3=ABS(DIST)
```

```
SUBROUTINE NXTPNT      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00         PAGE      2

                             DIST4=DIST5=DIST6=10E50
                             GO TO 4
 60                 20       CALL SEARCH(I,B,LESS,MORE)
                             DIST1=B-TER(I,LESS,1)
                             DIST1=ABS(DIST1)
                             DIST2=TER(I,MORE,1)-B
                             DIST2=ABS(DIST2)
 65                          DIST3=DIST4=DIST5=DIST6=10E50
                             IF(I.NE.1)DIST3=WHERE(I)-WHERE(I-1)
                             IF(I.NE.IROW)DIST4=WHERE(I+1)-WHERE(I)
                             GO TO 4
                    30       CALL SEARCH(IROW,B,LESS,MORE)
 70                          DIST1=B-TER(IROW,LESS,1)
                             DIST1=ABS(DIST1)
                             DIST2=TER(IROW,MORE,1)-B
                             DIST2=ABS(DIST2)
                             DIST3=A-WHERE(IROW)
 75                          DIST3=ABS(DIST3)
                             DIST4=DIST5=DIST6=10E50
                             GO TO 4
                             END


 SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE      REFERENCES
    4  NXTPNT          1           38        49

VARIABLES      SN   TYPE          RELOCATION
    0  A            REAL               F.P.    REFS          8       9      26      28      56      74
                                            DEFINED          1
  454  AA           REAL                       REFS         32      33 DEFINED      31
    0  B            REAL               F.P.    REFS         16      17      18      20      22      24      50
                                                 52         54      60      61      63      69      70      72
                                            DEFINED          1
   13  COSPGL       REAL               / /     REFS          2      30
10070  CUTCOST      REAL               / /     REFS          2
10067  CUTNET       REAL               / /     REFS          2
  455  DIST         REAL                       REFS         35      36      37      46      47      48      57
                                            DEFINED         34      36      45      47
  446  DIST1        REAL                       REFS         19      34      39      45      53      62      71
                                            DEFINED         18      19      39      52      53      61      62
                                                 70         71
  447  DIST2        REAL                       REFS         21      34      40      45      55      64      73
                                            DEFINED         20      21      40      54      55      63      64
                                                 72         73
  450  DIST3        REAL                       REFS         23      34      41      45      75
                                            DEFINED         22      23      41      56      57      65      66
                                                 74         75
  451  DIST4        REAL                       REFS         25      34      42      45 DEFINED      24      25
                                                 42         58      65      67      76
  452  DIST5        REAL                       REFS         27      31      32      34      43      45
                                            DEFINED         26      27      32      43      58      65      76
  453  DIST6        REAL                       REFS         29      31      33      34      44      45
```

```
      SUBROUTINE NXTPNT      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     3

VARIABLES      SN  TYPE               RELOCATION
                                                 DEFINED      28      29      33      44      58      65      76
10072 ECOST     REAL                    / /          REFS       2
10073 ELIMHI    REAL                    / /          REFS       2
10074 ELIMLO    REAL                    / /          REFS       2
10071 FILCOST   REAL                    / /          REFS       2
10066 FILLNET   REAL                    / /          REFS       2
  437 I         INTEGER                              REFS       8       9      13      14      60      61      63
                                                     3*66    3*67 DEFINED       7
  440 IBEG      INTEGER                              REFS      15      16      18      24      28      32      33
                                                  DEFINED      13
  441 IEND      INTEGER                              REFS      17      20      22      26      32      33
                                                  DEFINED      14
    2 IFXTRAP   INTEGER                 / /          REFS       2      11
  221 IROW      INTEGER                 / /          REFS       2       7      67      69      70      72      74
  456 LESS      INTEGER                              REFS      50      52      60      61      69      70
  442 LESSB     INTEGER                              REFS      16      18
  444 LESSE     INTEGER                              REFS      17      20
  457 MORE      INTEGER                              REFS      50      54      60      63      69      72
  443 MOREB     INTEGER                              REFS      16      24
  445 MOREE     INTEGER                              REFS      17      22
   65 NPGL      INTEGER                 / /          REFS       2
   64 NTMP      INTEGER                 / /          REFS       2
   67 PGL       REAL         ARRAY      / /          REFS       2
   66 RELAREA   REAL                    / /          REFS       2
    5 RUNE      REAL         ARRAY      / /          REFS       2
    3 RUNS      REAL         ARRAY      / /          REFS       2
    0 SEGBEG    REAL                    / /          REFS       2
    1 SEGEND    REAL                    / /          REFS       2
   12 SINPGL    REAL                    / /          REFS       2
   11 SPSTEP    REAL                    / /          REFS       2
    0 STEP      REAL                    F.P.      DEFINED       1      37      48
  431 STPMIN    REAL                                 REFS    2*36    2*47 DEFINED       6
  222 TER       REAL         ARRAY      / /          REFS       2      18      20      22      24      52      54
                                                       61      63      70      72
10062 TLSTART   REAL         ARRAY      / /          REFS       2
10064 TLSTOP    REAL         ARRAY      / /          REFS       2
   14 TMP       REAL         ARRAY      / /          REFS       2
  137 WHERE     REAL         ARRAY      / /          REFS       2       8       9      26      28    2*32    2*33
                                                       56    2*66    2*67      74

EXTERNALS            TYPE    ARGS       REFERENCES
        ERROR                  1           11      46      51
        SEARCH                 4           16      17      50      60      69

INLINE FUNCTIONS     TYPE    ARGS           DEF LINE  REFERENCES
        ABS          REAL      1  INTRIN                 19      21      23      25      27      29      30      53
                                                         55      57      62      64      71      73      75
        AMIN1        REAL      0  INTRIN                 31      34      45

STATEMENT LABELS              DEF LINE   REFERENCES
    0  1                         10           7
   36  2                         13           8
  172  3                         39          35
  147  4                         34          30      59      68      77
  242  10                        50          15
  276  20                        60           9
  337  30                        69          12
```

```
      SUBROUTINE NXTPNT      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00         PAGE      4

LOOPS  LABEL      INDEX       FROM-TO     LENGTH    PROPERTIES
   20  1        * I              7 10        11B           OPT       EXITS

COMMON BLOCKS    LENGTH       MEMBERS - BIAS NAME(LENGTH)
      / /           4157                    0 SEGBEG (1)                     1 SEGEND (1)                     2 IEXTRAP(1)
                                            3 RUNS   (3)                     6 RUNE   (3)                     9 SPSTEP (1)
                                           10 SINPGL (1)                    11 COSPGL (1)                    12 TMP    (40)
                                           52 NTMP   (1)                    53 NPGL   (1)                    54 RELAREA(1)
                                           55 PGL    (40)                   95 WHERE  (50)                  145 IROW   (1)
                                          146 TER    (4000)               4146 TLSTART(2)                  4148 TLSTOP (2)
                                         4150 FILLNET(1)                  4151 CUTNET (1)                  4152 CUTCOST(1)
                                         4153 FILCOST(1)                  4154 ECOST  (1)                  4155 ELIMHI (1)
                                         4156 ELIMLO (1)

STATISTICS
  PROGRAM LENGTH                  467B     311
  CM BLANK COMMON LENGTH        10075B    4157
```

```
      SUBROUTINE STPLT1(L.X.Y.NUM.BCD.NCHAR.NHABCD)
      REAL MAX. MIN. NEW
      DIMENSION X(100), Y(100), MAX(2), MIN(2)
      DIMENSION DIF(2).IORDR(2).IDIFF(2).NSCALE(5).SYMB(2).FAC(2)
      COMMON/STPCOM/IMAGE(2100)
      DATA(SYMB(I).I=1,2)/1HX,1HY/.(NSCALE(I).I=1,5)/1,0,0.0,0/
      SW = 1.0
      GO TO 50
 1000 CONTINUE
      ENTRY STPLT2
      SW = 0.0
   50 MAX(1) = MIN(1) = X(1)
      MAX(2) = MIN(2) = Y(1)
      DO 51 I = 2.NUM
      IF(X(I) .GT. MAX(1)) MAX(1) = X(I)
      IF(X(I) .LT. MIN (1)) MIN (1) = X (I)
      IF(Y(I) .GT. MAX(2)) MAX(2) = Y(I)
      IF(Y(I) .LT. MIN(2)) MIN(2) = Y(I)
   51 CONTINUE
      IPLACF = NSCALE(2) = NSCALE(4) = 0
      DO2 I=1.2
      DIF(I) = MAX(I) - MIN(I)
      IF(DIF(I).NE.0.0) GO TO 1
      DIF(I) = 2.0
      MAX(I) = MAX(I) + 1.0
      MIN(I) = MAX(I) - 2.0
      WRITE(11.101)SYMB(I)
    1 IORDR(I) = ALOG10(ABS(DIF(I)))
      IF(ABS(DIF(I)) .LT. 1.0)IORDR(I) = IORDR(I) - 1
      FAC(I) = 10.0**(-IORDR(I))
      OLD = MAX (I) *FAC(I)
      IF(OLD .GT. 0.0) OLD = OLD + 1.0
      NEW = AINT (OLD)
      IF(NEW .NE. OLD) MAX(I) = NEW/FAC(I)
      OLD = MIN(I)*FAC(I)
      IF(OLD .LT. 0.0) OLD = OLD - 1.0
      NEW = AINT (OLD)
      IF(NEW .NE. OLD) MIN(I) = NEW/FAC(I)
      IDIFF(I) = (MAX(I) -MIN(I))*FAC(I) + 0.1
      IF(IDIFF(I) .GT. 1) GO TO 2
      IDIFF(I) = 2
      IPLACE = 1
    2 CONTINUE
      ISUM = IDIFF(1) + IDIFF(2)
      IRATIO = (IDIFF(2)*10)/IDIFF(1)
      IF(IRATIO .LT. 5) GO TO 5
      IF(L .NE. 0) GO TO 7
      IF(IRATIO .GT. 20) GO TO 6
      GO TO 30
    5 IF(ISUM .LT. 8) GO TO 28
      INEW = (IDIFF(1) + 1)/2
      IPLACE = INEW - IDIFF(2)
      IDIFF(2) = INEW
      GO TO 30
    6 IF(ISUM .GT. 8) GO TO 21
      IDIFF(2) = 2*IDIFF(1)
      GO TO 29
```

```
SUBROUTINE STPLT1     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     2

                  21 INEW = (IDIFF(2) + 1)/2
                     IPLACE = INEW - IDIFF(1)
                     IDIFF(1) = INEW
                     GO TO 30
                   7 J = 113/(5*IDIFF(1))
                     IF(3*J*IDIFF(2).LT. 55) GO TO 8
                     IF(ISUM .LT. 8) GO TO 27
                     IF(MOD(IDIFF(2),2).NE.0)MAX(2)=MAX(2)+(MAX(2)-MIN(2))/
                    1           FLOAT(IDIFF(2))
                     IDIFF(2) = (IDIFF(2) + 1)/2
                     GO TO 7
                  27 IDIFF(1) = 2*IDIFF(1)
                     IPLACE = IPLACE + 1
                     GO TO 7
                  28 IDIFF(1) = 2*IDIFF(2)
                  29 IPLACE = 1
                  30 J = 113/(5*IDIFF(1))
                   8 DO 12 I = 1,2
                     K = 6 - 2*I
                     IF(ABS(MAX(I)).LT. 1.0E4) GO TO 9
                     OLD = MAX (I)
                     GO TO 10
                   9 IF(ABS(MIN(I)).GT. 1.0E-4 .OR. ABS(MAX(I)) .GT. 1. 0E-3) GO TO 11
                     OLD = MIN (I)
                     IF (OLD .EQ. 0.0) OLD = MAX (I)
                  10 NOR = -ALOG10(ABS(OLD))
                     IF(ABS(OLD) .LT. 1.0) NOR = NOR + 1
                     NSCALE(K) = NOR
                     IORDR(I) = IORDR(I) + NOR
                     WRITE(1,102)SYMB(I),NOR
                  11 IF(IORDR(I) .GT. 0) IORDR(I) = 0
                  12 NSCALE(K+1) = IPLACE - IORDR(I)
                     CALL PLOT1(NSCALE,IDIFF(2),3*J,IDIFF(1),5*J)
                     CALL PLOT2(IMAGE,MAX(1),MIN(1),MAX(2),MIN(2))
                     IF(SW .EQ. 0.0) RETURN
                     CALL PLOT3(BCD,X,Y,NUM,IMAGE)
                     CALL  PLOT4(NCHAR,NHABCD,IMAGE)
                     RETURN
                 101 FORMAT(1H[illegible]3X,39H********** GRAPH SIZE INDETERMINATE IN ,A1,
                    1       21H [illegible]IRECTION **********)
                 102 FORMAT(1H0,23X,29H********** PRINTED VALUES OF ,A1, 9H ARE 1.0E,
                    1       I3,31H TIMES ACTUAL VALUES **********)
                     END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE      REFERENCES
    4  STPLT1            1
   23  STPLT2           10          92         95

VARIABLES       SN  TYPE               RELOCATION
    0  BCD          REAL                     F.P.          REFS         93     DEFINED        1
  605  DIF          REAL         ARRAY                     REFS          4          23         28         29    DEFINED        22         24
```

```
      SUBROUTINE STPLT1      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     3

VARIABLES       SN   TYPE            RELOCATION
 622  FAC        REAL       ARRAY                   REFS       4        31        34        35        38        39
                                                 DEFINED      30
 570  I          INTEGER                            REFS    2*15      2*16      2*17      2*18      3*22        23        24
                                                    2*25    2*26        27      2*28      3*29      2*30      2*31      2*34
                                                    2*35    2*38      4*39        40        41        76        77        78
                                                    2*80      81        82      2*86        87      2*88        89
                                                 DEFINED      14        21        75
 611  IDIFF      INTEGER    ARRAY                   REFS       4        40      2*44      2*45        51        52        56
                                                      58      59        62        63      2*65        67        69        72
                                                      74    2*90   DEFINED        39        41        53        56        60
                                                      67      69        72
   0  IMAGE      INTEGER    ARRAY     STPCOM        REFS       5        91        93        94
 575  INEW       INTEGER                            REFS      52        53        59        60   DEFINED        51        58
 607  IORDR      INTEGER    ARRAY                   REFS       4        29        30        86        88        89
                                                 DEFINED      28        29        86        88
 571  IPLACE     INTEGER                            REFS      70        89   DEFINED        20        42        52        59
                                                      70      73
 574  IRATIO     INTEGER                            REFS      46        48   DEFINED        45
 573  ISUM       INTEGER                            REFS      50        55        64   DEFINED        44
 576  J          INTEGER                            REFS      63      2*90   DEFINED        62        74
 577  K          INTEGER                            REFS      85        89   DEFINED        76
   0  L          INTEGER              F.P.          REFS      47   DEFINED         1
 601  MAX        REAL       ARRAY                   REFS       2         3        15        17        22        25        26
                                                      31      39      2*65        77        78        80        82      2*91
                                                 DEFINED      12        13        15        17        25        34        65
 603  MIN        REAL       ARRAY                   REFS       2         3        16        18        22        35        39
                                                      65      80        81      2*91   DEFINED        12        13        16
                                                      18      26        38
   0  NCHAR      INTEGER              F.P.          REFS      94   DEFINED         1
 566  NEW        REAL                               REFS       2      2*34      2*38   DEFINED        33        37
   0  NMABCD     INTEGER              F.P.          REFS      94   DEFINED         1
 600  NOR        INTEGER                            REFS      84        85        86        87   DEFINED        83        84
 613  NSCALE     INTEGER    ARRAY                   REFS       4        90   DEFINED         6      2*20        85        89
   0  NUM        INTEGER              F.P.          REFS      14        93   DEFINED         1
 572  OLD        REAL                               REFS    2*32        33        34      2*36        37        38        82
                                                      83      84   DEFINED        31        32        35        36        78
                                                      81      82
 567  SW         REAL                               REFS      92   DEFINED         7        11
 620  SYMB       REAL       ARRAY                   REFS       4        27        87   DEFINED         6
   0  X          REAL       ARRAY     F.P.          REFS       3        12      2*15      2*16        93
                                                 DEFINED       1
   0  Y          REAL       ARRAY     F.P.          REFS       3        13      2*17      2*18        93
                                                 DEFINED       1

FILE NAMES       MODE
      TAPE11     FMT                          WRITES        27        87

EXTERNALS           TYPE    ARGS        REFERENCES
      ALOG10     REAL       1 LIBRARY       28        83
      PLOT1                 5               90
      PLOT2                 5               91
      PLOT3                 5               93
      PLOT4                 3               94

INLINE FUNCTIONS    TYPE    ARGS          DEF LINE  REFERENCES
      ABS        REAL       1  INTRIN                 28        29        77      2*80        83        84
      AINT       REAL       1  INTRIN                 33        37
      SUBROUTINE STPLT1      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

INLINE FUNCTIONS    TYPE    ARGS          DEF LINE  REFERENCES
      FLOAT       REAL       1  INTRIN                 65
      MOD         INTEGER    2  INTRIN                 65

STATEMENT LABELS                DEF LINE    REFERENCES
  120  1                            28          23
  215  2                            43          21         40
  242  5                            50          46
  256  6                            55          48
  276  7                            62          47         68         71
  344  8                            75          63
  361  9                            80          77
  377  10                           83          79
  426  11                           88          80
    0  12                           89          75
  264  21                           58          55
  324  27                           69          64
  332  28                           72          50
  335  29                           73          57
  337  30                           74          49         54         61
   35  50                           12           8
    0  51                           19          14
  533  101      FMT                 96          27
  544  102      FMT                 98          87
    0  1000         INACTIVE         9

LOOPS  LABEL      INDEX       FROM-TO     LENGTH      PROPERTIES
   44  51          I           14 19        23B          OPT
   74  2        *  I           21 43       124B                    EXT REFS
  345  12       *  I           75 89        71B                    EXT REFS

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
      STPCOM      2100                 0 IMAGE  (2100)

STATISTICS
  PROGRAM LENGTH                  644B       420
  CM LABELED COMMON LENGTH      4064B       2100
```

```
               SUBROUTINE PLOT1(P1.P2.P3.P4.P5)
               REAL LINPUNY
               INTEGER WORDS.COLS.COLM1
               DIMENSION IVT(15),NP2(4),P1(5)
               DIMENSION SCALE(5)
               COMMON/COMPLOT/NSCALE(5),NHL,NSBH,NVL,NSBV.XMAX.XMIN.YMAX.YMIN.
              1    IRCD.NDATA,IOMIT,NOBOT,NOORD.NOAB.VT(15).COLM1.COLS.LINES.
              2    WORDS.IDASH(13).ISPACE(13).UNYPLIN.UNXPCOL.LINPUNY.COLPUNX.
              3    MAT1(3).MAT2(2),MAT3(3).ISIZE.KORE.LIMIT.BAD1.BAD2.BAD3.I,
              4    J.K.T.MTF.MPC,NCHAR.NGT9.LAB
               EQUIVALENCE (VT.IVT),       (T.IT).(NP2.NHL)
               EQUIVALENCE (NSCALE.SCALE)
               DATA NGT9/10/
               DATA BAD1.BAD2.BAD3/0.0.0/
               DATA (MAT1(I).I=1.3)/10H(1X.R1.2X..10HF8.3.1X.13.4HA10)/.MAT2.
              1     MAT2(2)/10H(1X.R1.11X.7H.13A10)/
              2                  .MPC.MTF/77B.7770000000000000008/
               DATA NHL.NSBH.NVL.NSBV/5.3*10/.NOBOT,NOORD.NOAB/3*0/.COLM1.COLS.
              1    LINES.WORDS.ISIZE.KORE.LIMIT/100.101.51.11.561.10.123/
               DATA (IDASH(K),K=1.11)/10*10H+---------.1H+/
               DATA(ISPACE(K),K=1.11)/11*1HI/
               DATA IZ.M1,M2.M3.M4,M5.M6/33B.770000000000008.777777000000008.
              1    100000000000008.770000B             ,10000000B.1000000000000000
              20B/
               DATA(MAT3(I).I=1.3)/10H(8X.F9.3. .10H14(  1X.  .10H    F9.3))/
               DATA SCALE(2).SCALE(4)/1.0.1.0/
         C        ***           (1)           (2)           (3)
         C        MAT1        (1X.A1.2X.F8.3.1X.13A10)
         C        MAT2        (1X.A1.11X.13A10)              NO CHANGES
         C                                 X XXX
         C        ***                       M2
         C       MAT3       (8X.F9.3( 14(    1X.      F9.3))
         C                IZ IS BIAS TO CONVERT TO DISPLAY CODE
               BAD1=0.0
               BAD2=0.0
               BAD3=0.0
               DO 1 I=1.5
          1    VT(I)=P1(I)
               VT(6)=P2
               VT(7)=P3
               VT(8)=P4
               VT(9)=P5
               IF(IVT.NE.0)GO TO 2
               NSCALE=0
               SCALE(2)=1.0
               NSCALE(3)=3
               SCALE(4)=1.0
               NSCALE(5)=3
               GO TO 6
          2    DO 5 I=1.5
               IT=IABS(IVT(I))
               K1=IT.AND.MTF
               IF(K1.EQ.0)3.4
          3    NSCALE(I)=IVT(I)
               GO TO 5
          4    NSCALE(I)=VT(I)
          5    CONTINUE
```

```
      IF(NSCALE(3).LT.0)NSCALE(3)=-NSCALE(3)
      IF(NSCALE(5).LT.0)NSCALE(5)=-NSCALE(5)
      IF(NSCALE(2).EQ.0)51,52
51    SCALE(2)=1.0
      GO TO 53
52    SCALE(2)=10.0**NSCALE(2)
53    IF(NSCALE(4).EQ.0)54,55
54    SCALE(4)=1.0
      GO TO 6
55    SCALE(4)=10.0**NSCALE(4)
6     DO 9 I=6,9
      IF(IVT(I).EQ.0)GO TO 999
      T=ABS(VT(I))
      IF(T.LT.1)7,8
7     NP2(I-5)=IT
      GO TO 9
8     NP2(I-5)=T
9     CONTINUE
      LINES=NHL*NSBH+1
      COLM1=NSBV*NVL
      COLS=COLM1+1
      IF(COLS.GT.LIMIT)GO TO 999
      DO 19 I=1,26
19    IDASH(I)=10H
      WORDS=(COLS+KORE-1)/KORE
      ISIZE=LINES*WORDS
      IF(NSCALE(3).GT.7)NSCALE(3)=7
      IF(NSCALE(5).GT.8)NSCALE(5)=8
      NGT9=NSBV
      DO 29 I=1,10
      IF(NGT9.LT.10)28,30
28    NGT9=NGT9+NSBV
29    CONTINUE
30    NT=NGT9-9
      IVT=NT/100
      IVT(2)=(NT-IVT*100)/10
      IVT(3)=NT-(IVT*100+IVT(2)*10)+IZ
      NT=((IVT+IZ)*10000B+(IVT(2)+IZ)*100B+IVT(3))*M5
      MAT3(2)=MAT3(2).AND..NOT.M2
      MAT3(2)=MAT3(2).OR.NT
      MAT1(2)=MAT1(2).AND..NOT.M1
      NT=(NSCALE(3)+IZ)*M3
      MAT1(2)=MAT1(2).OR.NT
      LAB=NSCALE(5)+IZ
      LAB = SHIFT (LAB,12)
      MAT3=MAT3.AND..NOT.M4
      MAT3(3)=MAT3(3).AND..NOT.M4
      MAT3=MAT3.OR.LAB
      MAT3(3)=MAT3(3).OR.LAB
      CALL DASPXXX
      GO TO 99
999   BAD1=1.0
      WRITE(11,1000)
1000  FORMAT(*BAD INPUT PLOT1*)
99    T=BAD1
      RETURN
      END
```

```
        SUBROUTINE PLOT1      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     3

CARD NR. SEVERITY  DETAILS     DIAGNOSIS OF PROBLEM

     15      I      MAT2       DATA VARIABLE LIST EXCEEDS ITEM LIST. EXCESS VARIABLES NOT INITIALIZED.
     37      I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.
     43      I      IVT        ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
     44      I      NSCALE     ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
     50      I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.
     68      I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.
     80      I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.
     87      I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.
     92      I      IVT        ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
     93      I      IVT        ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
     94      I      IVT        ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
     95      I      IVT        ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
    103      I      MAT3       ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
    103      I      MAT3       ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
    105      I      MAT3       ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.
    105      I      MAT3       ARRAY NAME OPERAND NOT SUBSCRIPTED, FIRST ELEMENT WILL BE USED.


        SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  PLOT1           1          113

VARIABLES       SN  TYPE              RELOCATION
    117  RAD1       REAL                     COMPLOT       REFS          6        112   DEFINED        14         34        109
    120  RAD2       REAL                     COMPLOT       REFS          6    DEFINED        14         35
    121  RAD3       REAL                     COMPLOT       REFS          6    DEFINED        14         36
     42  COLM1      INTEGER                  COMPLOT       REFS          3          6        78   DEFINED         18         77
    103  COLPUNX    REAL                     COMPLOT       REFS          6
     43  COLS       INTEGER                  COMPLOT       REFS          3          6        79         82   DEFINED         18         78
    122  I          INTEGER                  COMPLOT       REFS          6       2*38        51       2*54       2*56         69         70
                                                             72         74         81   DEFINED         37         50         68         80
                                                             87
     15  IBCD       INTEGER                  COMPLOT       REFS          6
     46  IDASH      INTEGER         ARRAY    COMPLOT       REFS          6    DEFINED        20         81
     17  IOMIT      INTEGER                  COMPLOT       REFS          6
    114  ISIZE      INTEGER                  COMPLOT       REFS          6    DEFINED        18         83
     63  ISPACE     INTEGER         ARRAY    COMPLOT       REFS          6    DEFINED        21
    125  IT         INTEGER                  COMPLOT       REFS         11         52        72   DEFINED         51
     23  IVT        INTEGER         ARRAY    COMPLOT       REFS          4         11        43         51         54         69         93
                                                           2*94       3*95    DEFINED        92         93         94
    340  IZ         INTEGER                                REFS         94       2*95        99        101   DEFINED         22
    123  J          INTEGER                  COMPLOT       REFS          6
    124  K          INTEGER                  COMPLOT       REFS          6
    115  KORE       INTEGER                  COMPLOT       REFS          6       2*82   DEFINED         18
    361  K1         INTEGER                                REFS         53    DEFINED        52
    132  LAB        INTEGER                  COMPLOT       REFS          6        102       105        106   DEFINED        101        102
    116  LIMIT      INTEGER                  COMPLOT       REFS          6         79   DEFINED         18
     44  LINES      INTEGER                  COMPLOT       REFS          6         83   DEFINED         18         76
    102  LINPUNY    REAL                     COMPLOT       REFS          2          6
    104  MAT1       INTEGER         ARRAY    COMPLOT       REFS          6         98       100    DEFINED         15         98        100
    107  MAT2       INTEGER         ARRAY    COMPLOT       REFS          6    DEFINED        15
```

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        SUBROUTINE PLOT1      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE      4

VARIABLES      SN  TYPE               RELOCATION
  111  MAT3        INTEGER    ARRAY   COMPLOT        REFS        6        96        97       103       104       105       106
                                                  DEFINED       25        96        97       103       104       105       106
  127  MPC         INTEGER            COMPLOT        REFS        6   DEFINED        15
  126  MTF         INTEGER            COMPLOT        REFS        6        52   DEFINED        15
  341  M1          INTEGER                           REFS       98   DEFINED        22
  342  M2          INTEGER                           REFS       96   DEFINED        22
  343  M3          INTEGER                           REFS       99   DEFINED        22
  344  M4          INTEGER                           REFS      103       104   DEFINED        22
  345  M5          INTEGER                           REFS       95   DEFINED        22
  346  M6        * INTEGER                        DEFINED       22
  130  NCHAR       INTEGER            COMPLOT        REFS        6
   16  NDATA       INTEGER            COMPLOT        REFS        6
  131  NGT9        INTEGER            COMPLOT        REFS        6        88        89        91   DEFINED        13        86
                                                       89
    5  NML         INTEGER            COMPLOT        REFS        6        11        76   DEFINED        18
   22  NOAB        INTEGER            COMPLOT        REFS        6   DEFINED        18
   20  NOBOT       INTEGER            COMPLOT        REFS        6   DEFINED        18
   21  NOORD       INTEGER            COMPLOT        REFS        6   DEFINED        18
    5  NP2         INTEGER    ARRAY   COMPLOT        REFS        4        11   DEFINED        72        74
    6  NSBH        INTEGER            COMPLOT        REFS        6        76   DEFINED        18
   10  NSBV        INTEGER            COMPLOT        REFS        6        77        86        89   DEFINED        18
    0  NSCALE      INTEGER    ARRAY   COMPLOT        REFS        6        12      2*58      2*59        60        63        64
                                                       67       84        85        99       101   DEFINED        44        46
                                                       48       54        56        58        59        84        85
  362  NT          INTEGER                           REFS       92        93        94        97       100
                                                  DEFINED       91        95        99
    7  NVL         INTEGER            COMPLOT        REFS        6        77   DEFINED        18
    0  P1          REAL       ARRAY    F.P.          REFS        4        38   DEFINED         1
    0  P2          REAL                F.P.          REFS       39   DEFINED         1
    0  P3          REAL                F.P.          REFS       40   DEFINED         1
    0  P4          REAL                F.P.          REFS       41   DEFINED         1
    0  P5          REAL                F.P.          REFS       42   DEFINED         1
    0  SCALE       REAL       ARRAY   COMPLOT        REFS        5        12   DEFINED      2*26        45        47        61
                                                       63       65        67
  125  T           REAL               COMPLOT        REFS        6        11        71        74   DEFINED        70       112
  101  UNXPCOL     REAL               COMPLOT        REFS        6
  100  UNYPLIN     REAL               COMPLOT        REFS        6
   23  VT          REAL       ARRAY   COMPLOT        REFS        6        11        56        70   DEFINED        38        39
                                                       40       41        42
   45  WORDS       INTEGER            COMPLOT        REFS        3         6        83   DEFINED        18        82
   11  XMAX        REAL               COMPLOT        REFS        6
   12  XMIN        REAL               COMPLOT        REFS        6
   13  YMAX        REAL               COMPLOT        REFS        6
   14  YMIN        REAL               COMPLOT        REFS        6

FILE NAMES        MODE
      TAPE11      FMT                   WRITES       110

EXTERNALS           TYPE    ARGS         REFERENCES
       DASPXXX                0             107

INLINE FUNCTIONS    TYPE    ARGS          DEF LINE  REFERENCES
       ABS          REAL      1   INTRIN                  70
       IABS         INTEGER   1   INTRIN                  51
       SHIFT        NO TYPE   2   INTRIN                 102
      SUBROUTINE PLOT1       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     5

 STATEMENT LABELS                    DEF LINE   REFERENCES
     0  1                               38        37
    60  2                               50        43
     0  3              INACTIVE         54        53
    76  4                               56        53
   101  5                               57        50          55
   135  6                               68        49          66
     0  7              INACTIVE         72        71
   153  8                               74        71
   156  9                               75        68          73
     0  19                              81        80
     0  28             INACTIVE         89        88
     0  29                              90        87
   236  30                              91        88
     0  51             INACTIVE         61        60
   120  52                              63        60
   124  53                              64        62
     0  54             INACTIVE         65        64
   131  55                              67        64
   326  99                             112       108
   321  999                            109        69          79
   352  1000     FMT                   111       110

 LOOPS  LABEL      INDEX       FROM-TO     LENGTH     PROPERTIES
    26  1          I            37 38          4B      INSTACK
    61  5          I            50 57         23B         OPT
   136  9        * I            68 75         23B         OPT      EXITS
   177  19         I            80 81          4B      INSTACK
   225  29       * I            87 90         10B         OPT      EXITS

 COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
        COMPLOT     91                0 NSCALE (5)                  5 NHL      (1)                 6 NSBH     (1)
                                      7 NVL     (1)                 8 NSBV     (1)                 9 XMAX     (1)
                                     10 XMIN    (1)                11 YMAX     (1)                12 YMIN     (1)
                                     13 IRCD    (1)                14 NDATA    (1)                15 IOMIT    (1)
                                     16 NOBOT   (1)                17 NOORD    (1)                18 NOAB     (1)
                                     19 VT      (15)               34 COLM1    (1)                35 COLS     (1)
                                     36 LINES   (1)                37 WORDS    (1)                38 IDASH    (13)
                                     51 ISPACE  (13)               64 UNYPLIN(1)                  65 UNXPCOL(1)
                                     66 LINPUNY(1)                 67 COLPUNX(1)                  68 MAT1     (3)
                                     71 MAT2    (2)                73 MAT3     (3)                76 ISIZE    (1)
                                     77 KORE    (1)                78 LIMIT    (1)                79 BAD1     (1)
                                     80 HAD2    (1)                81 HAD3     (1)                82 I        (1)
                                     83 J       (1)                84 K        (1)                85 T        (1)
                                     86 MTF     (1)                87 MPC      (1)                88 NCHAR    (1)
                                     89 NGT9    (1)                90 LAB      (1)

 EQUIV CLASSES   LENGTH      MEMBERS - BIAS NAME(LENGTH)
NSCALE  NSCALE        5               0 SCALE  (5)
NSCALE  NHL           4               0 NP2    (4)
NSCALE  VT           15               0 IVT    (15)
NSCALE  T             1               0 IT     (1)

 STATISTICS
   PROGRAM LENGTH                  375B      253
   CM LABELED COMMON LENGTH        133B       91
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SUBROUTINE PLOT2       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     1

 1                    SUBROUTINE PLOT2(IMAGE,P1,P2,P3,P4)
                      REAL LINPUNY
                      INTEGER WORDS.COLS.COLM1
                      DIMENSION IMAGE(1)
 5                    COMMON/COMPLOT/NSCALE(5).NHL.NSBH.NVL.NSBV.XMAX.XMIN.YMAX.YMIN.
                     1    IBCD.NDATA.ICMIT.NOBOT.NOORD.NOAB.VT(15).COLM1.COLS.LINES.
                     2    WORDS.IDASH(13).ISPACE(13).UNYPLIN.UNXPCOL.LINPUNY.COLPUNX.
                     3    MAT1(3),MAT2(2),MAT3(3),ISIZE,KORE,LIMIT,BAD1.BAD2.BAD3.I.
                     4    J.K.T.MTF,MPC,NCHAR,NGT9,LAB
10                    IF(BAD1.GT.0)GO TO 999
                      XMAX=P1
                      XMIN=P2
                      YMAX=P3
                      YMIN=P4
15                    IF(XMAX.LE.XMIN.OR.YMAX.LE.YMIN) GO TO 999
                      UNXPCOL=(XMAX-XMIN)/COLM1
                      UNYPLIN=(YMAX-YMIN)/(LINES-1)
                      LINPUNY=(LINES-1)/(YMAX-YMIN)
                      COLPUNX=COLM1/(XMAX-XMIN)
20                    K1=-WORDS
                      IG=0
                      DO 49 I=1.LINES
                      K1=K1+WORDS
                      IF((I-IG*NSBH).EQ.1)10.20
25               10   IG=IG+1
                      DO 19 K=1.WORDS
                 19   IMAGE(K+K1)=IDASH(K)
                      GO TO 49
                 20   DO 29 K=1.WORDS
30               29   IMAGE(K+K1)=ISPACE(K)
                 49   CONTINUE
                      GO TO 99
                999   BAD2=2.0
                      WRITE(11.1000)
35             1000   FORMAT(* BAD INPUT PLOT2*)
                 99   T=BAD2
                      RETURN
                      END


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

    22     I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.
    26     I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.
    29     I                 CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.


        SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   4  PLOT2          1             37
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     SUBROUTINE PLOT2       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE             RELOCATION
   117  RAD1        REAL                 COMPLOT        REFS          5        10
   120  RAD2        REAL                 COMPLOT        REFS          5        36    DEFINED        33
   121  RAD3        REAL                 COMPLOT        REFS          5
    42  COLM1       INTEGER              COMPLOT        REFS          3         5         16        19
   103  COLPUNX     REAL                 COMPLOT        REFS          5    DEFINED        19
    43  COLS        INTEGER              COMPLOT        REFS          3         5
   122  I           INTEGER              COMPLOT        REFS          5        24    DEFINED        22
    15  IRCD        INTEGER              COMPLOT        REFS          5
    17  ICMIT       INTEGER              COMPLOT        REFS          5
    46  IDASH       INTEGER    ARRAY     COMPLOT        REFS          5        27
   144  IG          INTEGER                             REFS         24        25    DEFINED        21        25
     0  IMAGE       INTEGER    ARRAY      F.P.          REFS          4    DEFINED         1        27        30
   114  ISIZE       INTEGER              COMPLOT        REFS          5
    63  ISPACE      INTEGER    ARRAY     COMPLOT        REFS          5        30
   123  J           INTEGER              COMPLOT        REFS          5
   124  K           INTEGER              COMPLOT        REFS          5      2*27      2*30   DEFINED        26        29
   115  KORE        INTEGER              COMPLOT        REFS          5
   143  K1          INTEGER                             REFS         23        27        30   DEFINED        20        23
   132  LAB         INTEGER              COMPLOT        REFS          5
   116  LIMIT       INTEGER              COMPLOT        REFS          5
    44  LINES       INTEGER              COMPLOT        REFS          5        17        18        22
   102  LINPUNY     REAL                 COMPLOT        REFS          2         5    DEFINED        18
   104  MAT1        INTEGER    ARRAY     COMPLOT        REFS          5
   107  MAT2        INTEGER    ARRAY     COMPLOT        REFS          5
   111  MAT3        INTEGER    ARRAY     COMPLOT        REFS          5
   127  MPC         INTEGER              COMPLOT        REFS          5
   126  MTF         INTEGER              COMPLOT        REFS          5
   130  NCHAR       INTEGER              COMPLOT        REFS          5
    16  NDATA       INTEGER              COMPLOT        REFS          5
   131  NGT9        INTEGER              COMPLOT        REFS          5
     5  NHL         INTEGER              COMPLOT        REFS          5
    22  NOAB        INTEGER              COMPLOT        REFS          5
    20  NOROT       INTEGER              COMPLOT        REFS          5
    21  NOORD       INTEGER              COMPLOT        REFS          5
     6  NSBH        INTEGER              COMPLOT        REFS          5        24
    10  NSBV        INTEGER              COMPLOT        REFS          5
     0  NSCALE      INTEGER    ARRAY     COMPLOT        REFS          5
     7  NVL         INTEGER              COMPLOT        REFS          5
     0  P1          REAL                  F.P.          REFS         11    DEFINED         1
     0  P2          REAL                  F.P.          REFS         12    DEFINED         1
     0  P3          REAL                  F.P.          REFS         13    DEFINED         1
     0  P4          REAL                  F.P.          REFS         14    DEFINED         1
   125  T           REAL                 COMPLOT        REFS          5    DEFINED        36
   101  UNXPCOL     REAL                 COMPLOT        REFS          5    DEFINED        16
   100  UNYPLIN     REAL                 COMPLOT        REFS          5    DEFINED        17
    23  VT          REAL       ARRAY     COMPLOT        REFS          5
    45  WORDS       INTEGER              COMPLOT        REFS          3         5        20        23        26        29
    11  XMAX        REAL                 COMPLOT        REFS          5        15        16        19   DEFINED        11
    12  XMIN        REAL                 COMPLOT        REFS          5        15        16        19   DEFINED        12
    13  YMAX        REAL                 COMPLOT        REFS          5        15        17        18   DEFINED        13
    14  YMIN        REAL                 COMPLOT        REFS          5        15        17        18   DEFINED        14

FILE NAMES      MODE
     TAPE11     FMT                 WRITES      34
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      SUBROUTINE PLOT2       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     3

STATEMENT LABELS                        DEF LINE   REFERENCES
     0  10           INACTIVE              25         24
     0  19                                 27         26
   106  20                                 29         24
     0  29                                 30         29
   115  49                                 31         22         28
   127  99                                 36         32
   122  999                                33         10         15
   136  1000    FMT                        35         34

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   65  49      * I            22 31        33B                 NOT INNER
   77  19        K            26 27         5B       INSTACK
  107  29        K            29 30         5B       INSTACK

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
      COMPLOT        91                 0 NSCALE (5)                 5 NHL     (1)                 6 NSBH    (1)
                                        7 NVL    (1)                 8 NSBV    (1)                 9 XMAX    (1)
                                       10 XMIN   (1)                11 YMAX    (1)                12 YMIN    (1)
                                       13 IBCD   (1)                14 NDATA   (1)                15 ICMIT   (1)
                                       16 NOBOT  (1)                17 NOORD   (1)                18 NOAB    (1)
                                       19 VT     (15)               34 COLM1   (1)                35 COLS    (1)
                                       36 LINES  (1)                37 WORDS   (1)                38 IDASH   (13)
                                       51 ISPACE (13)               64 UNYPLIN(1)                 65 UNXPCOL(1)
                                       66 LINPUNY(1)                67 COLPUNX(1)                 68 MAT1    (3)
                                       71 MAT2   (2)                73 MAT3    (3)                76 ISIZE   (1)
                                       77 KORE   (1)                78 LIMIT   (1)                79 BAD1    (1)
                                       80 BAD2   (1)                81 BAD3    (1)                82 I       (1)
                                       83 J      (1)                84 K       (1)                85 T       (1)
                                       86 MTF    (1)                87 MPC     (1)                88 NCHAR   (1)
                                       89 NGT9   (1)                90 LAB     (1)

STATISTICS
  PROGRAM LENGTH                     160B       112
  CM LABELED COMMON LENGTH           133B        91
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```
      SUBROUTINE PLOT 3(KAR,W,Z,NK,IMAGE)
      REAL LINPUNY
      INTEGER WORDS,COLS,COLM1
      DIMENSION W(1),Z(1),IMAGE(1)
      COMMON/COMPLOT/NSCALE(5),NHL,NSBH,NVL,NSBV,XMAX,XMIN,YMAX,YMIN,
     1     IBCD,NDATA,IOMIT,NOBOT,NOORD,NOAB,VT(15),COLM1,COLS,LINES,
     2     WORDS,IDASH(13),ISPACE(13),UNYPLIN,UNXPCOL,LINPUNY,COLPUNX,
     3     MAT1(3),MAT2(2),MAT3(3),ISIZE,KORE,LIMIT,BAD1,BAD2,BAD3,I,
     4     J,K,T,MTF,MPC,NCHAR,NGT9,LAB
      EQUIVALENCE (N,XNK),(T,IT),(Y,IY),(X,IX)
      N=NK
      IF(NK.EQ.0)GO TO 999
      LAB=KAR
      LAB=SHIFT(LAB,6)
      IBCD=LAB.AND.MPC
      NDATA=IABS(NK)
      IT=MTF.AND.NDATA
      IF(IT.NE.0)NDATA=ABS(XNK)
      IF(BAD2.GT.0)GO TO 999
C ***      POSITION NDATA CHARACTER IN PLOT IMAGE
      DO 99 I=1,NDATA
      X=W(I)
      Y=Z(I)
      IF(Y.EQ.0)GO TO 10
      IT=IABS(IY)
      IT=IT.AND.MTF
      IF(IT.EQ.0)GO TO 999
   10 K1=((YMAX-Y)*LINPUNY)+1.5
      IF(K1.GT.LINES.OR.K1.LT.1) GO TO 90
      IF(IX.EQ.0)GO TO 20
      IT=IABS(IX)
      IF(IT.EQ.0)GO TO 999
   20 K2=((X-XMIN)*COLPUNX)+1.5
      IF(K2.LT.1.OR.K2.GT.COLS)GO TO 90
      IS=(K2+KORE-1)/KORE
      MOVE=KORE*IS-K2
      IS=IS+(WORDS*(K1-1))
      NM=MPC
      NC=IBCD
   22 IF(MOVE.EQ.0)GO TO 25
      NM=SHIFT(NM,6)
      NC=SHIFT(NC,6)
      MOVE=MOVE-1
      GO TO 22
   25 CONTINUE
      IT=IMAGE(IS).AND..NOT.NM
      IMAGE(IS)=IT.OR.NC
      GO TO 99
C ***      GO TO 90 FOR POINT OFF PLOT
   90 BAD3=-3.0
   99 CONTINUE
      GO TO 100
  999 BAD3=3.0
      WRITE(11,1000)
 1000 FORMAT(* NO PLOT2 OR BAD INPUT PLOT3*)
  100 T=BAD3
      RETURN
```

```
        SUBROUTINE PLOT3    74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420      09/02/77  13.54.00     PAGE    2

                       END


CARD NR. SEVERITY DETAILS   DIAGNOSIS OF PROBLEM

      21    I             CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.


        SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS    DEF LINE    REFERENCES
     4 PLOT3           1       57

 VARIABLES    SN  TYPE          RELOCATION
   117 RAD1      REAL               COMPLOT     REFS         5
   120 RAD2      REAL               COMPLOT     REFS         5        19
   121 RAD3      REAL               COMPLOT     REFS         5        56  DEFINED        50       53
    42 COLM1     INTEGER            COMPLOT     REFS         3         5
   103 COLPUNX   REAL               COMPLOT     REFS         5        33
    43 COLS      INTEGER            COMPLOT     REFS         3         5       34
   122 I         INTEGER            COMPLOT     REFS         5        22       23   DEFINED       21
    15 IBCD      INTEGER            COMPLOT     REFS         5        39  DEFINED        15
    46 IDASH     INTEGER   ARRAY    COMPLOT     REFS         5
     0 IMAGE     INTEGER   ARRAY     F.P.       REFS         4        46  DEFINED         1       47
    17 IOMIT     INTEGER            COMPLOT     REFS         5
   221 IS        INTEGER                        REFS        36        37       46        47  DEFINED       35        37
   114 ISIZE     INTEGER            COMPLOT     REFS         5
    63 ISPACE    INTEGER   ARRAY    COMPLOT     REFS         5
   125 IT        INTEGER            COMPLOT     REFS        10        18       26        27       32       47
                                              DEFINED       17        25       26        31       46
   227 IX        INTEGER   *UNDEF               REFS        10        30       31
   226 IY        INTEGER   *UNDEF               REFS        10        25
   123 J         INTEGER            COMPLOT     REFS         5
   124 K         INTEGER            COMPLOT     REFS         5
     0 KAR       INTEGER             F.P.       REFS        13   DEFINED        1
   115 KORE      INTEGER            COMPLOT     REFS         5      2*35       36
   217 K1        INTEGER                        REFS      2*29        37  DEFINED        28
   220 K2        INTEGER                        REFS      2*34        35       36   DEFINED       33
   132 LAB       INTEGER            COMPLOT     REFS         5        14       15   DEFINED       13       14
   116 LIMIT     INTEGER            COMPLOT     REFS         5
    44 LINES     INTEGER            COMPLOT     REFS         5        29
   102 LINPUNY   REAL               COMPLOT     REFS         2         5       28
   104 MAT1      INTEGER   ARRAY    COMPLOT     REFS         5
   107 MAT2      INTEGER   ARRAY    COMPLOT     REFS         5
   111 MAT3      INTEGER   ARRAY    COMPLOT     REFS         5
   222 MOVE      INTEGER                        REFS        40        43  DEFINED        36       43
   127 MPC       INTEGER            COMPLOT     REFS         5        15       38
   126 MTF       INTEGER            COMPLOT     REFS         5        17       26
   225 N         INTEGER                        REFS        10   DEFINED       11
   224 NC        INTEGER                        REFS        42        47  DEFINED        39       42
   130 NCHAR     INTEGER            COMPLOT     REFS         5
    16 NDATA     INTEGER            COMPLOT     REFS         5        17       21   DEFINED       16       18
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        SUBROUTINE PLOT3       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     3

 VARIABLES       SN   TYPE                 RELOCATION
    131  NGT9         INTEGER                   COMPLOT     REFS         5
      5  NHL          INTEGER                   COMPLOT     REFS         5
      0  NK           INTEGER                    F.P.       REFS        11        12         16    DEFINED        1
    223  NM           INTEGER                               REFS        41        46    DEFINED         38       41
     22  NOAB         INTEGER                   COMPLOT     REFS         5
     20  NOBOT        INTEGER                   COMPLOT     REFS         5
     21  NOORD        INTEGER                   COMPLOT     REFS         5
      6  NSBH         INTEGER                   COMPLOT     REFS         5
     10  NSBV         INTEGER                   COMPLOT     REFS         5
      0  NSCALE       INTEGER       ARRAY       COMPLOT     REFS         5
      7  NVL          INTEGER                   COMPLOT     REFS         5
    125  T            REAL                      COMPLOT     REFS         5
    101  UNXPCOL      REAL                      COMPLOT     REFS         5        10    DEFINED         56
    100  UNYPLIN      REAL                      COMPLOT     REFS         5
     23  VT           REAL          ARRAY       COMPLOT     REFS         5
      0  W            REAL          ARRAY        F.P.       REFS         5
     45  WORDS        INTEGER                   COMPLOT     REFS         4        22    DEFINED          1
    227  X            REAL                                  REFS         3         5       37
     11  XMAX         REAL                      COMPLOT     REFS        10        33    DEFINED         22
     12  XMIN         REAL                      COMPLOT     REFS         5
    225  XNK          REAL                                  REFS         5        33
    226  Y            REAL                                  REFS        10        18
     13  YMAX         REAL                      COMPLOT     REFS        10        24         28    DEFINED       23
     14  YMIN         REAL                      COMPLOT     REFS         5        28
      0  Z            REAL          ARRAY        F.P.       REFS         5
                                                                         4        23    DEFINED          1
 FILE NAMES          MODE
        TAPE11       FMT                        WRITES         54

 INLINE FUNCTIONS     TYPE      ARGS            DEF LINE   REFERENCES
        ABS           REAL        1  INTRIN                    18
        IABS          INTEGER     1  INTRIN                    16         25        31
        SHIFT         NO TYPE     2  INTRIN                    14         41        42

 STATEMENT LABELS                        DEF LINE   REFERENCES
     67  10                                 28          24
    110  20                                 33          30
    142  22                                 40          44
    153  25                                 45          40
    163  90                                 50          29         34
    166  99                                 51          21         48
    200  100                                56          52
    173  999                                53          12         19         27         32
    207  1000      FMT                      55          54

 LOOPS  LABEL      INDEX        FROM-TO     LENGTH    PROPERTIES
    47  99       * I             21 51        122B        OPT       EXITS

 COMMON BLOCKS    LENGTH        MEMBERS - BIAS NAME(LENGTH)
        COMPLOT       91                  0 NSCALE (5)                 5 NHL      (1)                6 NSBH     (1)
                                          7 NVL     (1)                8 NSBV     (1)                9 XMAX     (1)
                                         10 XMIN    (1)               11 YMAX     (1)               12 YMIN     (1)
                                         13 IRCD    (1)               14 NDATA    (1)               15 IOMIT    (1)
                                         16 NOBOT   (1)               17 NOORD    (1)               18 NOAB     (1)
                                         19 VT      (15)              34 COLM1    (1)               35 COLS     (1)
                                         36 LINES   (1)               37 WORDS    (1)               38 IDASH    (13)
                                         51 ISPACE  (13)              64 UNYPLIN(1)                 65 UNXPCOL(1)
      SUBROUTINE PLOT3      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00        PAGE     4

   COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
                                         66 LINPUNY(1)            67 COLPUNX(1)            68 MAT1    (3)
                                         71 MAT2    (2)           73 MAT3    (3)           76 ISIZE   (1)
                                         77 KORE    (1)           78 LIMIT   (1)           79 BAD1    (1)
                                         80 BAD2    (1)           81 BAD3    (1)           82 I       (1)
                                         83 J       (1)           84 K       (1)           85 T       (1)
                                         86 MTF     (1)           87 MPC     (1)           88 NCHAR   (1)
                                         89 NGT9    (1)           90 LAB     (1)

   EQUIV CLASSES   LENGTH      MEMBERS - BIAS NAME(LENGTH)
           N            1                 0 XNK     (1)
           Y            1                 0 IY      (1)
           X            1                 0 IX      (1)
  NSCALE   T            1                 0 IT      (1)

   STATISTICS
     PROGRAM LENGTH                2438     163
     CM LABELED COMMON LENGTH      133B      91
```

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SUBROUTINE PLOT4       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     1

             SUBROUTINE PLOT4(NN.LABEL.IMAGE)
             REAL LINPUNY
             INTEGER WORDS.COLS.COLM1
             DIMENSION LABEL(1).IMAGE(1)
             DIMENSION SCALE(5)
             COMMON/COMPLOT/NSCALE(5).NHL.NSBH.NVL.NSBV.XMAX.XMIN.YMAX.YMIN.
            1    IBCD.NDATA.IOMIT.NOBOT.NOORD.NOAB.VT(15).COLM1.COLS.LINES.
            2    WORDS.IDASH(13).ISPACE(13).UNYPLIN.UNXPCOL.LINPUNY.COLPUNX.
            3    MAT1(3).MAT2(2).MAT3(3).ISIZE.KORE.LIMIT.BAD1.BAD2.BAD3.I.
            4    J.K.T.MTF.MPC.NCHAR.NGT9.LAB
             EQUIVALENCE (I.XNN)
             EQUIVALENCE (NSCALE.SCALE)
             I=NN
             J=LINES
             IF(NOBOT.NE.0)J=J-1
             NCHAR=IABS(NN)
             IT=NCHAR.AND.MTF
             IF(IT.NE.0)NCHAR=ABS(XNN)
             IF((BAD1+BAD2+BAD3).GT.0)GO TO 999
             K2=0
             K4=0
             DO 99 I=1.J
             IF(I.GT.NCHAR)GO TO 25
             K1=(I-1)/KORE+1
             IF(K1.GT.K2)20.21
          20 K2=K1
             LAB=LABEL(K2)
          21 LAB=SHIFT(LAB.6)
             GO TO 26
          25 LAB=1H
          26 K3=K4+1
             K4=K4+WORDS
             K1=MOD(I.NSBH)
             IF(K1.NE.1)GO TO 50
             IF(NOORD.NE.0)GO TO 50
             VALUE=(YMAX-(I-1)*UNYPLIN)*SCALE(2)
             WRITE(11.MAT1)LAB.VALUE.(IMAGE(K).K=K3.K4)
             GO TO 99
          50 WRITE(11.MAT2)LAB.(IMAGE(K).K=K3.K4)
          99 CONTINUE
             IF(NOAB.NE.0)RETURN
             J=0
             DO 109 I=1.COLS.NGT9
             J=J+1
             VT(J)=(XMIN+(I-1)*UNXPCOL)*SCALE(4)
         109 CONTINUE
       C     FOLLOWING MHS CODE INSERTS PROPER REPEAT FACTOR IN MAT3.
             LAB=10000000000000B*(MOD(J-1.10)+100B*((J-1)/10)+3333B)
             LAB=SHIFT(LAB.12)
             MAT3(2)=(MAT3(2).AND.7777777777777777B).OR.LAB
             WRITE(11.MAT3)(VT(I).I=1.J)
             RETURN
         999 WRITE(11.1001)
        1001 FORMAT(* NO PLOT MADE*)
             RETURN
             END
```

```
           SUBROUTINE PLOT4       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00          PAGE      2

       CARD NR. SEVERITY  DETAILS     DIAGNOSIS OF PROBLEM

          22     I                    CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.
          43     I                    CONTROL VARIABLE IN COMMON OR EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.


           SYMBOLIC REFERENCE MAP (R=3)

       ENTRY POINTS      DEF LINE      REFERENCES
           4  PLOT4            1          41          52          55

       VARIABLES       SN  TYPE              RELOCATION
         117  RAD1         REAL                   COMPLOT     REFS        6        19
         120  RAD2         REAL                   COMPLOT     REFS        6        19
         121  RAD3         REAL                   COMPLOT     REFS        6        19
          42  COLM1        INTEGER                COMPLOT     REFS        3         6
         103  COLPUNX      REAL                   COMPLOT     REFS        6
          43  COLS         INTEGER                COMPLOT     REFS        3         6        43
         122  I            INTEGER                COMPLOT     REFS        6        11        23        24        33        36        45
                                                                51  DEFINED        13        22        43        51
          15  IRCD         INTEGER                COMPLOT     REFS        6
          46  IDASH        INTEGER     ARRAY      COMPLOT     REFS        6
           0  IMAGE        INTEGER     ARRAY       F.P.       REFS        4        37        39   DEFINED         1
          17  IOMIT        INTEGER                COMPLOT     REFS        6
         114  ISIZE        INTEGER                COMPLOT     REFS        6
          63  ISPACE       INTEGER     ARRAY      COMPLOT     REFS        6
         252  IT           INTEGER                            REFS       18   DEFINED        17
         123  J            INTEGER                COMPLOT     REFS        6        15        22        44        45      2*48        51
                                                           DEFINED       14        15        42        44
         124  K            INTEGER                COMPLOT     REFS        6        37        39   DEFINED        37        39
         115  KORE         INTEGER                COMPLOT     REFS        6        24
         255  K1           INTEGER                            REFS       25        26        34   DEFINED        24        33
         253  K2           INTEGER                            REFS       25        27   DEFINED        20        26
         256  K3           INTEGER                            REFS       37        39   DEFINED        31
         254  K4           INTEGER                            REFS       31        32        37        39   DEFINED        21        32
         132  LAB          INTEGER                COMPLOT     REFS        6        28        37        39        49        50
                                                           DEFINED       27        28        30        48        49
           0  LABEL        INTEGER     ARRAY       F.P.       REFS        4        27   DEFINED         1
         116  LIMIT        INTEGER                COMPLOT     REFS        6
          44  LINES        INTEGER                COMPLOT     REFS        6        14
         102  LINPUNY      REAL                   COMPLOT     REFS        2         6
         104  MAT1         INTEGER     ARRAY      COMPLOT     REFS        6        37
         107  MAT2         INTEGER     ARRAY      COMPLOT     REFS        6        39
         111  MAT3         INTEGER     ARRAY      COMPLOT     REFS        6        50        51   DEFINED        50
         127  MPC          INTEGER                COMPLOT     REFS        6
         126  MTF          INTEGER                COMPLOT     REFS        6        17
         130  NCHAR        INTEGER                COMPLOT     REFS        6        17        23   DEFINED        16        18
          16  NDATA        INTEGER                COMPLOT     REFS        6
         131  NGT9         INTEGER                COMPLOT     REFS        6        43
           5  NHL          INTEGER                COMPLOT     REFS        6
           0  NN           INTEGER                 F.P.       REFS       13        16   DEFINED         1
          22  NOAB         INTEGER                COMPLOT     REFS        6        41
          20  NOROT        INTEGER                COMPLOT     REFS        6        15
          21  NOORD        INTEGER                COMPLOT     REFS        6        35
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      SUBROUTINE PLOT4       74/74   OPT=0 ROUND=*/ TRACE               FTN 4.6+420       09/02/77  13.54.00        PAGE     3

VARIABLES       SN  TYPE            RELOCATION
      6  NSBH        INTEGER                 COMPLOT    REFS         6      33
     10  NSBV        INTEGER                 COMPLOT    REFS         6
      0  NSCALE      INTEGER      ARRAY      COMPLOT    REFS         6      12
      7  NVL         INTEGER                 COMPLOT    REFS         6
      0  SCALE       REAL         ARRAY      COMPLOT    REFS         5      12       36       45
    125  T           REAL                    COMPLOT    REFS         6
    101  UNXPCOL     REAL                    COMPLOT    REFS         6      45
    100  UNYPLIN     REAL                    COMPLOT    REFS         6      36
    257  VALUE       REAL                               REFS        37   DEFINED    36
     23  VT          REAL         ARRAY      COMPLOT    REFS         6      51    DEFINED    45
     45  WORDS       INTEGER                 COMPLOT    REFS         3       6       32
     11  XMAX        REAL                    COMPLOT    REFS         6
     12  XMIN        REAL                    COMPLOT    REFS         6      45
    122  XNN         REAL                    COMPLOT    REFS        11      18
     13  YMAX        REAL                    COMPLOT    REFS         6      36
     14  YMIN        REAL                    COMPLOT    REFS         6

FILE NAMES          MODE
      TAPE11        FMT                  WRITES        37          39        51        53

INLINE FUNCTIONS    TYPE     ARGS              DEF LINE   REFERENCES
      ABS           REAL       1    INTRIN                    18
      IABS          INTEGER    1    INTRIN                    16
      MOD           INTEGER    2    INTRIN                    33          48
      SHIFT         NO TYPE    2    INTRIN                    28          49

STATEMENT LABELS                    DEF LINE     REFERENCES
      0  20               INACTIVE     26           25
     72  21                            28           25
     74  25                            30           23
    101  26                            31           29
    135  50                            39           34        35
    145  99                            40           22        38
      0  109                           46           43
    216  999                           53           19
    244  1001      FMT                 54           53

LOOPS   LABEL      INDEX       FROM-TO     LENGTH      PROPERTIES
   51   99       * I           22 40        77B                      EXT REFS
  156   109        I           43 46        14B             OPT

COMMON BLOCKS    LENGTH        MEMBERS - BIAS NAME(LENGTH)
     COMPLOT        91                 0 NSCALE  (5)           5 NHL      (1)            6 NSBH    (1)
                                       7 NVL     (1)           8 NSBV     (1)            9 XMAX    (1)
                                      10 XMIN    (1)          11 YMAX     (1)           12 YMIN    (1)
                                      13 IRCD    (1)          14 NDATA    (1)           15 IOMIT   (1)
                                      16 NOROT   (1)          17 NOORD    (1)           18 NOAB    (1)
                                      19 VT      (15)         34 COLM1    (1)           35 COLS    (1)
                                      36 LINES   (1)          37 WORDS    (1)           38 IDASH   (13)
                                      51 ISPACE  (13)         64 UNYPLIN  (1)           65 UNXPCOL (1)
                                      66 LINPUNY (1)          67 COLPUNX  (1)           68 MAT1    (3)
                                      71 MAT2    (2)          73 MAT3     (3)           76 ISIZE   (1)
                                      77 KORE    (1)          78 LIMIT    (1)           79 BAD1    (1)
                                      80 BAD2    (1)          81 BAD3     (1)           82 I       (1)
                                      83 J       (1)          84 K        (1)           85 T       (1)
                                      86 MTF     (1)          87 MPC      (1)           88 NCHAR   (1)
                                      89 NGT9    (1)          90 LAB      (1)
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        SUBROUTINE PLOT4       74/74    OPT=0 ROUND=*/ TRACE               FTN 4.6+420'          09/02/77  13.54.00        PAGE     4

  EQUIV CLASSES    LENGTH      MEMBERS - BIAS NAME(LENGTH)
 NSCALE  NSCALE         5                 0 SCALE   (5)
 NSCALE  I              1                 0 XNN     (1)

  STATISTICS
    PROGRAM LENGTH                   267B      183
    CM LABELED COMMON LENGTH         133B       91
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SUBROUTINE OMIT        74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00        PAGE     1

      1                 SUBROUTINE OMIT(IARG)
                        REAL LINPUNY
                        INTEGER WORDS,COLS,COLM1
                        COMMON/COMPLOT/NSCALE(5),NHL,NSBH,NVL,NSBV,XMAX,XMIN,YMAX,YMIN,
      5               1   IRCD,NDATA,IOMIT,NOBOT,NOORD,NOAB,VT(15),COLM1,COLS,LINES,
                      2   WORDS,IDASH(13),ISPACE(13),UNYPLIN,UNXPCOL,LINPUNY,COLPUNX
                      3   MAT1(3),MAT2(2),MAT3(3),ISIZE,KORE,LIMIT,BAD1,BAD2,BAD3,I,
                      4   J,K,T,MTF,MPC,NCHAR,NGT9,LAB
                        EQUIVALENCE (I,ARG)
     10                 I=IARG
                        IF(IARG.LT.0)GO TO 10
                        IT=IARG.AND.MTF
                        IOMIT=IARG
                        IF(IT.NE.0)IOMIT=ARG
     15                 NOAB=IOMIT.AND.1
                        NOORD=IOMIT.AND.2
                        NOBOT=IOMIT.AND.4
                        RETURN
                  10    IT=MTF.AND..NOT.IARG
     20                 IOMIT=.NOT.IARG
                        IF(IT.NE.0)IOMIT=ABS(ARG)
                        NOAB=IOMIT.AND..NOT.1
                        NOORD=IOMIT.AND..NOT.2
                        NOBOT=IOMIT.AND..NOT.4
     25                 RETURN
                        END


 SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    4  CMIT          1            18         25

VARIABLES        SN  TYPE                RELOCATION
  122  ARG           REAL                  COMPLOT     REFS        9        14        21
  117  BAD1          REAL                  COMPLOT     REFS        4
  120  BAD2          REAL                  COMPLOT     REFS        4
  121  BAD3          REAL                  COMPLOT     REFS        4
   42  COLM1         INTEGER               COMPLOT     REFS        3         4
  103  COLPUNX       REAL                  COMPLOT     REFS        4
   43  COLS          INTEGER               COMPLOT     REFS        3         4
  122  I             INTEGER               COMPLOT     REFS        4         9    DEFINED      10
    0  IARG          INTEGER               F.P.        REFS       10        11        12        13        19        20
                                                    DEFINED        1
   15  IRCD          INTEGER               COMPLOT     REFS        4
   45  IDASH         INTEGER     ARRAY     COMPLOT     REFS        4
   17  IOMIT         INTEGER               COMPLOT     REFS        4        15        16        17        22        23        24
                                                    DEFINED       13        14        20        21
  114  ISIZE         INTEGER               COMPLOT     REFS        4
   63  ISPACE        INTEGER     ARRAY     COMPLOT     REFS        4
   56  IT            INTEGER                           REFS       14        21    DEFINED      12        19
  123  J             INTEGER               COMPLOT     REFS        4
  124  K             INTEGER               COMPLOT     REFS        4
  115  KORE          INTEGER               COMPLOT     REFS        4
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     SUBROUTINE OMIT        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE      2

VARIABLES       SN  TYPE            RELOCATION
  132  LAB         INTEGER                 COMPLOT        REFS          4
  116  LIMIT       INTEGER                 COMPLOT        REFS          4
   44  LINES       INTEGER                 COMPLOT        REFS          4
  102  LINPUNY     REAL                    COMPLOT        REFS          2       4
  104  MAT1        INTEGER     ARRAY       COMPLOT        REFS          4
  107  MAT2        INTEGER     ARRAY       COMPLOT        REFS          4
  111  MAT3        INTEGER     ARRAY       COMPLOT        REFS          4
  127  MPC         INTEGER                 COMPLOT        REFS          4
  126  MTF         INTEGER                 COMPLOT        REFS          4      12         19
  130  NCHAR       INTEGER                 COMPLOT        REFS          4
   16  NDATA       INTEGER                 COMPLOT        REFS          4
  131  NGT9        INTEGER                 COMPLOT        REFS          4
    5  NHL         INTEGER                 COMPLOT        REFS          4
   22  NOAB        INTEGER                 COMPLOT        REFS          4   DEFINED       15         22
   20  NOBOT       INTEGER                 COMPLOT        REFS          4   DEFINED       17         24
   21  NOORD       INTEGER                 COMPLOT        REFS          4   DEFINED       16         23
    6  NSBH        INTEGER                 COMPLOT        REFS          4
   10  NSBV        INTEGER                 COMPLOT        REFS          4
    0  NSCALE      INTEGER     ARRAY       COMPLOT        REFS          4
    7  NVL         INTEGER                 COMPLOT        REFS          4
  125  T           REAL                    COMPLOT        REFS          4
  101  UNXPCOL     REAL                    COMPLOT        REFS          4
  100  UNYPLIN     REAL                    COMPLOT        REFS          4
   23  VT          REAL        ARRAY       COMPLOT        REFS          4
   45  WORDS       INTEGER                 COMPLOT        REFS          3       4
   11  XMAX        REAL                    COMPLOT        REFS          4
   12  XMIN        REAL                    COMPLOT        REFS          4
   13  YMAX        REAL                    COMPLOT        REFS          4
   14  YMIN        REAL                    COMPLOT        REFS          4

INLINE FUNCTIONS    TYPE    ARGS        DEF LINE  REFERENCES
       ABS          REAL      1  INTRIN                21

STATEMENT LABELS               DEF LINE   REFERENCES
   35  10                         19          11

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       COMPLOT      91               0 NSCALE  (5)                 5 NHL      (1)                6 NSBH     (1)
                                     7 NVL     (1)                 8 NSBV     (1)                9 XMAX     (1)
                                    10 XMIN    (1)                11 YMAX     (1)               12 YMIN     (1)
                                    13 IBCD    (1)                14 NDATA    (1)               15 IOMIT    (1)
                                    16 NOBOT   (1)                17 NOORD    (1)               18 NOAB     (1)
                                    19 VT      (15)               34 COLM1    (1)               35 COLS     (1)
                                    36 LINES   (1)                37 WORDS    (1)               38 IDASH    (13)
                                    51 ISPACE  (13)               64 UNYPLIN(1)                 65 UNXPCOL(1)
                                    66 LINPUNY(1)                 67 COLPUNX(1)                 68 MAT1     (3)
                                    71 MAT2    (2)                73 MAT3     (3)               76 ISIZE    (1)
                                    77 KORE    (1)                78 LIMIT    (1)               79 BAD1     (1)
                                    80 BAD2    (1)                81 BAD3     (1)               82 I        (1)
                                    83 J       (1)                84 K        (1)               85 T        (1)
                                    86 MTF     (1)                87 MPC      (1)               88 NCHAR    (1)
                                    89 NGT9    (1)                90 LAB      (1)

  EQUIV CLASSES    LENGTH     MEMBERS - BIAS NAME(LENGTH)
 NSCALE  I              1               0 ARG     (1)
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          SUBROUTINE OMIT       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     3

      STATISTICS
        PROGRAM LENGTH                 57B       47
        CM LABELED COMMON LENGTH      133B       91
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COMPSUB
STORAGE ALLOCATION.                                   COMPASS 3.3-420.     09/02/77  13.56.47.      PAGE     1

           ADDRESS   LENGTH           BINARY CONTROL CARDS.

                 0       30           IDENT COMPSUB
                30                    END

                                BLOCKS    TYPE      ADDRESS   LENGTH

                                PROGRAM*  LOCAL           0       30
                                COMPLOT   COMMON          0      133

                                ENTRY POINTS.

                                DASPXXX         0+
COMPSUB                                                  COMPASS 3.3-420.     09/02/77  13.56.47.       PAGE    2

                                         IDENT  COMPSUB
                                         ENTRY  DASPXXX
                                         USE    /COMPLOT/
     0                      5   NSCALE   BSS    5                    PARMS(USED TO ALTER STANDARD PLOTS)
     5                      1   NHL      BSS    1                    NO. HORIZONTAL GRID LINE
     6                      1   NSRH     BSS    1                    NO. OF SPACES BETWEEN HOR. GRIDS
     7                      1   NVL      BSS    1                    NO. OF VERTICAL GRID LINES
    10                      1   NSRV     BSS    1                    NO. OF SPACES BETWEEN VERT. GRIDS
    11                      1   XMAX     BSS    1                    VALUE OF ABSCISSA AT RIGHT GRID
    12                      1   XMIN     BSS    1                    VALUE OF ABSCISSA AT LEFT GRID
    13                      1   YMAX     BSS    1                    BALUE OF ORDINATE AT TOP GRID
    14                      1   YMIN     BSS    1                    VALUE OF ORDINATE AT BOTTOM GRID
    15                      1   IBCD     BSS    1                    BCD PLOT CHARACTER
    16                      1   NDATA    BSS    1                    NO. OF POINTS TO PLOT (SINGLE CALL)
    17                      1   IOMIT    BSS    1                    VALUE OF ARG OF OMIT CALL
    20                      1   NCHOT    BSS    1                    FLAG FOR OMITTING BOTTOM GRID LINE
    21                      1   NOORD    BSS    1                    FLAG FOR OMITTING ORDINATE VALUES
    22                      1   NOAB     BSS    1                    FLAG FOR OMITTING ABSCISSA VALUES
    23                     17   VT       BSS    15                   TEMPORARY WORKING AREA
    42                      1   COLM1    BSS    1                    NO. OF COLUMNS-1 IN A LINE (IMAGE)
    43                      1   COLS     BSS    1                    NO. COLUMNS IN A LINE (IMAGE)
    44                      1   LINES    BSS    1                    NO. OF LINES TO BE PLOTTED
    45                      1   WORDS    BSS    1                    NO. OF WORDS IN A LINE
    46                     15   IDASH    BSS    13                   USED FOR GENERATING HOR. GRID LINES
    63                     15   ISPACE   BSS    13                   USED FOR GENERATING VERT GRID LINES
   100                      1   UNYPLIN  BSS    1                    UNITS OF Y PER LINE
   101                      1   UNXPCOL  BSS    1                    UNITS OF X PER COLUMN
   102                      1   LINPUNY  BSS    1                    LINES PER UNIT OF Y
   103                      1   COLPUNX  BSS    1                    LINES PER UNIT OF X
   104                      3   MAT1     BSS    3                    VARIABLE FORMAT (HOR GRID LINE)
   107                      2   MAT2     BSS    2                    VARIABLE FORMAT (NON-GRID LINE)
   111                      3   MAT3     BSS    3                    VARIABLE FORMAT (ORDINATE VALUES)
   114                      1   ISIZE    BSS    1                    SIZE OF IMAGE AREA (WORDS*LINES)
   115                      1   KORE     BSS    1                    NO. OF CHARACTER/MEMORY WORD (6400=10)
   116                      1   LIMIT    BSS    1                    MAX NO. CHARACTERS/LINE (501PR=123)
   117                      1   BAD1     BSS    1                    FLAG (BAD PLOT 1 CALL)
   120                      1   BAD2     BSS    1                    FLAG (BAD PLOT 2 CALL)
   121                      1   BAD3     BSS    1                    FLAG (BAD PLOT 3 CALL)
   122                      1   I        BSS    1                    COMMON VAR
   123                      1   J        BSS    1                    COMMON VAR
   124                      1   K        BSS    1                    COMMON VAR
   125                      1   T        BSS    1                    COMMON VAR
   126                      1   MTF      BSS    1                    MASK FOR TESTING FLOATING POINT
   127                      1   MPC      BSS    1                    RIGHTMOST CHARACTER MASK
   130                      1   NCHAR    BSS    1                    NO. CHARACTERS IN LABEL ARRAY
   131                      1   NGT9     BSS    1                    NO. SPACES BETWEEN PRINTER VERT GRIDS
   132                      1   LAB      BSS    1                    TEMPORARY
                                         USE    *
     0                      1   DASPXXX  BSSZ   1
     1  6110000046 C                     SB1    IDASH                LAY A LINE OF DASHES
                 6120000066              SB2    54
     2  5130000043 C                     SA3    COLS
                 63330                   SB3    X3
     3  6140000001                       SB4    1
                 66500                   SB5    B0
     4  7110000046                       SX1    46B                  DISPLAY CODE FOR DASH
                 0100000016 +            RJ     PLACE
```

```
 5  6110000046 C                    SB1     IDASH               INSERT + IN LINE OF DASHES WHERE
               6120000066           SB2     54                  VERTICAL LINE INTERSECTS
 6  5130000007 C                    SA3     NVL
               6233000001           SB3     X3+1
 7  5140000010 C                    SA4     NSBV
               63440                SB4     X4
10  7110000045                      SX1     45B                 DISPLAY CODE FKR PLUS
               0100000016 +         RJ      PLACE
                              *
11  6110000063 C                    SB1     ISPACE              LAY A LINE OF I FOR LINES CONTAINING
               6120000066           SB2     54                  VERTICAL COLUMNS
12  5130000007 C                    SA3     NVL
               6233000001           SB3     X3+1
13  5140000010 C                    SA4     NSBV
               63440                SB4     X4
14  7110000011                      SX1     11B
               0100000016 +         RJ      PLACE
15  0200000000 +                    JP      DASPXXX
                              *
                              *  THIS ROUTINE USER FOR PLACE CHARACTERS IN A ARRAY
```

```
COMPSUB                                                       COMPASS 3.3-420.     09/02/77  13.56.47.      PAGE     3

                                 *               X1 CONTAINS CHARACTER TO BE INSERTED
                                 *               B1-FIRST WORD ADDRESS OF ARRAY
                                 *               B2-OFFSET
                                 *               B3-NUMBER OF TIMES TO INSERT CHARACTER
                                 *               B4-NUMBER OF POSITIONS TO SKIP BETWEEN INSERTS
                                 *               B5-USED TO INDICATE SHIFT OF X1 (LEFT 6)BETWEEN INSERTS
                                 *               ROUTINE ALSO USES X0,X6,X2,B6,X3
    16                     1     PLACE    BSSZ   1
    17  43066                             MX0    54
    20  66600                    MLOOP    SB6    B0
             0450000021 +                 EQ     B5,B0,NOSH
                       20106              LX1    6
    21  15610                    NOSH     BX6    -X0*X1
             56210                        SA2    B1
                  22320                   LX3    B2,X0
                       11223              BX2    X2*X3
    22  22626                             LX6    B2,X6
             12662                        BX6    X6+X2
                  56610                   SA6    B1
    23  6122777771               NLOOP    SB2    B2-6                  SKIP N CHARACTERS
                  0620000025 +            PL     B2,OK
    24  6111000001                        SB1    B1+1
                  6120000066              SB2    54
    25  6166000001               OK       SB6    B6+1
                  0764000023 +            LT     B6,B4,NLOOP
    26  6133777776                        SB3    B3-1
                  0703000020 +            GT     B3,B0,MLOOP
    27  0200000016 +                      JP     PLACE
    30                                    END

                     50000B CM  STORAGE USED              106 STATEMENTS     50 SYMBOLS
                                MODEL 74 ASSEMBLY       1.468 SECONDS        68 REFERENCES
```

```
COMPSUB                                                                      COMPASS 3.3-420.    09/02/77  13.56.47.      PAGE     4
SYMBOLIC REFERENCE TABLE.

BAD1          117      COMPLOT         2/36 L
BAD2          120      COMPLOT         2/37 L
BAD3          121      COMPLOT         2/38 L
COLM1          42      COMPLOT         2/20 L
COLPUNX       103      COMPLOT         2/29 L
COLS           43      COMPLOT         2/21 L    2/52
DASPXXX         0      PROGRAM*        2/02 E    2/49 L    2/75
I             122      COMPLOT         2/39 L
IBCD           15      COMPLOT         2/13 L
IDASH          46      COMPLOT         2/24 L    2/50      2/58
IOMIT          17      COMPLOT         2/15 L
ISIZE         114      COMPLOT         2/33 L
ISPACE         63      COMPLOT         2/25 L    2/67
J             123      COMPLOT         2/40 L
K             124      COMPLOT         2/41 L
KORE          115      COMPLOT         2/34 L
LAB           132      COMPLOT         2/47 L
LIMIT         116      COMPLOT         2/35 L
LINES          44      COMPLOT         2/22 L
LINPUNY       102      COMPLOT         2/28 L
MAT1          104      COMPLOT         2/30 L
MAT2          107      COMPLOT         2/31 L
MAT3          111      COMPLOT         2/32 L
MLOOP          20      PROGRAM*        3/10 L    3/27
MPC           127      COMPLOT         2/44 L
MTF           126      COMPLOT         2/43 L
NCROT          20      COMPLOT         2/16 L
NCHAR         130      COMPLOT         2/45 L
NDATA          16      COMPLOT         2/14 L
NGT9          131      COMPLOT         2/46 L
NHL             5      COMPLOT         2/05 L
NLOOP          23      PROGRAM*        3/20 L    3/25
NOAB           22      COMPLOT         2/18 L
NOCRD          21      COMPLOT         2/17 L
NOSH           21      PROGRAM*        3/11      3/13 L
NSRH            6      COMPLOT         2/06 L
NSRV           10      COMPLOT         2/08 L    2/62      2/71
NSCALE          0      COMPLOT         2/04 L
NVL             7      COMPLOT         2/07 L    2/60      2/69
OK             25      PROGRAM*        3/21      3/24 L
PLACE          16      PROGRAM*        2/57      2/65      2/74      3/08 L    3/28
T             125      COMPLOT         2/42 L
UNXPCOL       101      COMPLOT         2/27 L
UNYPLIN       100      COMPLOT         2/26 L
VT             23      COMPLOT         2/19 L
WORDS          45      COMPLOT         2/23 L
XMAX           11      COMPLOT         2/09 L
XMIN           12      COMPLOT         2/10 L
YMAX           13      COMPLOT         2/11 L
YMIN           14      COMPLOT         2/12 L
S
```

```
SUBROUTINE ZONE       74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE      1

           SUBROUTINE ZONE(KAPR)
           COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
          1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
          2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
          3ELIMLO
           COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
           COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
          1OT
           PSTEP=ZONSTEP(KAPR)
           NTMP=2
           NPGL=0
           RELAREA=0.
           SEGBEG=0.
           DO 10 IDO=1,3
           RUNS(IDO)=APRSTR(KAPR,IDO)
     10    RUNE(IDO)=APREND(KAPR,IDO)
           HYP=SQRT((TLSTOP(1)-TLSTART(1))**2+(TLSTOP(2)-TLSTART(2))**2)
           SINA=(TLSTART(2)-TLSTOP(2))/HYP
           COSA=(TLSTOP(1)-TLSTART(1))/HYP
           A1=(RUNS(1)-TLSTART(1))*COSA-(RUNS(2)-TLSTART(2))*SINA
           B1=(RUNS(2)-TLSTART(2))*COSA+(RUNS(1)-TLSTART(1))*SINA
           A2=(RUNE(1)-TLSTART(1))*COSA-(RUNE(2)-TLSTART(2))*SINA
           B2=(RUNE(2)-TLSTART(2))*COSA+(RUNE(1)-TLSTART(1))*SINA
           RUNS(1)=A1
           RUNS(2)=B1
           RUNE(1)=A2
           RUNE(2)=B2
           HYPGL=SQRT((RUNE(1)-RUNS(1))**2+(RUNE(2)-RUNS(2))**2)
           SEGEND=HYPGL-1
           COSPGL=(RUNE(2)-RUNS(2))/HYPGL
           SINPGL=(RUNE(1)-RUNS(1))/HYPGL
           ALFWID=-0.5*APWID(KAPR)
           TMP(1,1)=ALFWID
           TMP(2,1)=ABS(ALFWID)
           TMP(1,2)=TMP(2,2)=0.0
           RETURN
           END


       SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE     REFERENCES
     4  ZONE            1          36

 VARIABLES      SN  TYPE            RELOCATION
   201  ALFWID       REAL                               REFS       33        34    DEFINED       32
    55  APREND       REAL         ARRAY     ZONES       REFS        7        16
    22  APRSTR       REAL         ARRAY     ZONES       REFS        7        15
   111  APTOT        REAL                   ZONES       REFS        7
    11  APWID        REAL         ARRAY     ZONES       REFS        7        32
   174  A1           REAL                               REFS       24    DEFINED       20
   176  A2           REAL                               REFS       26    DEFINED       22
   175  B1           REAL                               REFS       25    DEFINED       21
   177  B2           REAL                               REFS       27    DEFINED       23
```

```
      SUBROUTINE ZONE        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE    2

VARIABLES      SN  TYPE              RE[illegible]ON
   173  COSA       REAL                           REFS        20       21         22         23    DEFINED       19
    13  COSPGL     REAL                 / /       REFS         2  DEFINED         30
 10070  CUTCOST    REAL                 / /       REFS         2
 10067  CUTNET     REAL                 / /       REFS         2
     4  CUTPRCE    REAL                 TSV       REFS         6
 10072  FCOST      REAL                 / /       REFS         2
 10073  ELIMHI     REAL                 / /       REFS         2
 10074  ELIMLO     REAL                 / /       REFS         2
     1  ERCOST     REAL                 TSV       REFS         6
 10071  FILCOST    REAL                 / /       REFS         2
 10065  FILLNET    REAL                 / /       REFS         2
     3  FILPRCE    REAL                 TSV       REFS         6
   171  HYP        REAL                           REFS        18       19    DEFINED         17
   200  HYPGL      REAL                           REFS        29       30         31    DEFINED         28
   170  IDO        INTEGER                        REFS      2*15     2*16    DEFINED         14
     2  IEXTRAP    INTEGER              / /       REFS         2
   221  IROW       INTEGER              / /       REFS         2
     0  KAPR       INTEGER               F.P.     REFS         9       15         16         32    DEFINED        1
   110  NAPR       INTEGER              ZONES     REFS         7
     5  NERTH      INTEGER              TSV       REFS         6
    65  NPGL       INTEGER              / /       REFS         2  DEFINED         11
    64  NTMP       INTEGER              / /       REFS         2  DEFINED         10
    67  PGL        REAL       ARRAY     / /       REFS         2
     2  PSTEP      REAL                 TSV       REFS         6  DEFINED          9
    66  RELAREA    REAL                 / /       REFS         2  DEFINED         12
     6  RUNE       REAL       ARRAY     / /       REFS         2     2*22       2*23       2*28         30         31
                                               DEFINED        16       26         27
     3  RUNS       REAL       ARRAY     / /       REFS         2     2*20       2*21       2*28         30         31
                                               DEFINED        15       24         25
     0  SEGBEG     REAL                 / /       REFS         2  DEFINED         13
     1  SEGEND     REAL                 / /       REFS         2  DEFINED         29
   172  SINA       REAL                           REFS        20       21         22         23    DEFINED         18
    12  SINPGL     REAL                 / /       REFS         2  DEFINED         31
    11  SPSTEP     REAL                 / /       REFS         2
   222  TER        REAL       ARRAY     / /       REFS         2
     0  THCK       REAL                 TSV       REFS         6
 10062  TLSTART    REAL       ARRAY     / /       REFS         2     2*17         18         19       2*20       2*21       2*22
                                                  2*23
 10064  TLSTOP     REAL       ARRAY     / /       REFS         2     2*17         18         19
    14  TMP        REAL       ARRAY     / /       REFS         2  DEFINED         33         34       2*35
   137  WHERE      REAL       ARRAY     / /       REFS         2
     0  ZONSTEP    REAL       ARRAY     ZONES     REFS         7        9
                                                    .
EXTERNALS          TYPE     ARGS      REFERENCES
        SQRT       REAL      1 LIBRARY     17        28

INLINE FUNCTIONS   TYPE     ARGS        DEF LINE  REFERENCES
        ABS        REAL      1  INTRIN               34

STATEMENT LABELS              DEF LINE   REFERENCES
     0  10                       16         14

LOOPS  LABEL     INDEX       FROM-TO    LENGTH    PROPERTIES
   33  10        IDO          14 16       128        OPT
```

```
      SUBROUTINE ZONE        74/74    OPT=0 ROUND=*/ TRACE               FTN 4.6+420          09/02/77  13.54.00         PAGE     3

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
      / /        4157                  0 SEGBEG (1)                   1 SEGEND (1)                2 IEXTRAP(1)
                                       3 RUNS   (3)                   6 RUNE   (3)                9 SPSTEP (1)
                                      10 SINPGL (1)                  11 COSPGL (1)               12 TMP    (40)
                                      52 NTMP   (1)                  53 NPGL   (1)               54 RELAREA(1)
                                      55 PGL    (40)                 95 WHERE  (50)             145 IROW   (1)
                                     146 TER    (4000)             4146 TLSTART(2)             4148 TLSTOP (2)
                                    4150 FILLNET(1)                4151 CUTNET (1)             4152 CUTCOST(1)
                                    4153 FILCOST(1)                4154 ECOST  (1)             4155 ELIMHI (1)
                                    4156 ELIMLO (1)
      TSV           6                  0 THCK   (1)                   1 ERCOST (1)                2 PSTEP  (1)
                                       3 FILPRCE(1)                   4 CUTPRCE(1)                5 NERTH  (1)
      ZONES        74                  0 ZONSTEP(9)                   9 APWID  (9)               18 APRSTR (27)
                                      45 APREND (27)                 72 NAPR   (1)               73 APTOT  (1)

STATISTICS
  PROGRAM LENGTH                    2058      133
  CM LABELED COMMON LENGTH          1208       80
  CM BLANK COMMON LENGTH          100758     4157
```

```
SUBROUTINE PRICE        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE      1

 1                      SUBROUTINE PRICE
                        COMMON SEGBEG,SEGEND,IEXTRAP,RUNS(3),RUNE(3),SPSTEP,SINPGL,COSPGL,
                       1TMP(20,2),NTMP,NPGL,RELAREA,PGL(20,2),WHERE(50),IROW,TER(50,40,2),
                       2TLSTART(2),TLSTOP(2),FILLNET,CUTNET,CUTCOST,FILCOST,ECOST,ELIMHI,
 5                     3ELIMLO
                        COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
                        COMMON /TMPL/ IND,SWID,TWOCL,JACK
                        COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
                       1OT
10                      CUTNET=ABS(CUTNET)
                        CUTCOST=CUTNET*CUTPRCE
                        FILCOST=FILLNET*FILPRCE
                        ECOST=CUTCOST+FILCOST+APTOT
                        JACK=0
15                      THCK=0.0
                        WRITE(4,200)JACK,THCK
               200      FORMAT("1"5X*DESIGN SCHEME *I2,20X*THICKNESS OF *F5.2* INCHES*//)
                        WRITE(4,100) CUTPRCE,CUTNET,CUTCOST,FILPRCE,FILLNET,FILCOST,APTOT,
                       1ECOST
20             100      FORMAT(5X,*THE ESTIMATED COST PER CUBIC YARD OF CUT IS $*,F7.3,13X
                       1,*THE NET VOLUME OF CUT IS *,F10.0,* CUBIC YARDS*//35X,*THE ESTIMA
                       2TED COST OF CUT IS $*,F13.2//5X,*THE ESTIMATED COST PER CUBIC YARD
                       3 OF FILL IS $*,F7.3,12X,*THE NET VOLUME OF FILL IS *,F10.0,* CUBIC
                       4 YARDS*//35X,*THE ESTIMATED COST OF FILL IS $*,F13.2//5X,"THE TOTA
25                     5L COST FOR APPROACH ZONES IS $",F13.2//35X,"THE TOTAL COST OF EART
                       6HWORK IS ESTIMATED AT $",F13.2)
                        RETURN
                        END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    2  PRICE            1          27

VARIABLES       SN  TYPE              RELOCATION
   55  APREND     REAL        ARRAY   ZONES          REFS        8
   22  APRSTR     REAL        ARRAY   ZONES          REFS        8
  111  APTOT      REAL                ZONES          REFS        8        13        18
   11  APWID      REAL        ARRAY   ZONES          REFS        8
   13  COSPGL     REAL                 / /           REFS        2
10070  CUTCOST    REAL                 / /           REFS        2        13        18    DEFINED        11
10067  CUTNET     REAL                 / /           REFS        2        10        11          18    DEFINED        10
    4  CUTPRCE    REAL                TSV            REFS        6        11        18
10072  ECOST      REAL                 / /           REFS        2        18    DEFINED        13
10073  ELIMHI     REAL                 / /           REFS        2
10074  ELIMLO     REAL                 / /           REFS        2
    1  ERCOST     REAL                TSV            REFS        6
10071  FILCOST    REAL                 / /           REFS        2        13        18    DEFINED        12
10066  FILLNET    REAL                 / /           REFS        2        12        18
    3  FILPRCE    REAL                TSV            REFS        6        12        18
    2  IEXTRAP    INTEGER              / /           REFS        2
    0  IND        INTEGER             TMPL           REFS        7
  221  IROW       INTEGER              / /           REFS        2
```

```
      SUBROUTINE PRICE        74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE              RELOCATION
    3  JACK        INTEGER                 TMPL         REFS         7       16    DEFINED       14
  110  NAPR        INTEGER                 ZONES        REFS         8
    5  NERTH       INTEGER                 TSV          REFS         6
   65  NPGL        INTEGER                 / /          REFS         2
   64  NTMP        INTEGER                 / /          REFS         2
   67  PGL         REAL          ARRAY     / /          REFS         2
    2  PSTEP       REAL                    TSV          REFS         6
   66  RELAREA     REAL                    / /          REFS         2
    6  RUNE        REAL          ARRAY     / /          REFS         2
    3  RUNS        REAL          ARRAY     / /          REFS         2
    0  SEGBEG      REAL                    / /          REFS         2
    1  SEGEND      REAL                    / /          REFS         2
   12  SINPGL      REAL                    / /          REFS         2
   11  SPSTEP      REAL                    / /          REFS         2
    1  SWID        REAL                    TMPL         REFS         7
  222  TER         REAL          ARRAY     / /          REFS         2
    0  THCK        REAL                    TSV          REFS         6       16    DEFINED       15
10062  TLSTART     REAL          ARRAY     / /          REFS         2
10064  TLSTOP      REAL          ARRAY     / /          REFS         2
   14  TMP         REAL          ARRAY     / /          REFS         2
    2  TWOCL       REAL                    TMPL         REFS         7
  137  WHERE       REAL          ARRAY     / /          REFS         2
    0  ZONSTEP     REAL          ARRAY     ZONES        REFS         8

FILE NAMES          MODE
      TAPE4         FMT                      WRITES        16          18

INLINE FUNCTIONS    TYPE    ARGS          DEF LINE  REFERENCES
      ABS           REAL     1  INTRIN                  10

STATEMENT LABELS              DEF LINE   REFERENCES
   60  100       FMT             20          18
   35  200       FMT             17          16

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
      / /          4157              0 SEGBEG  (1)              1 SEGEND  (1)              2 IEXTRAP(1)
                                     3 RUNS    (3)              6 RUNE    (3)              9 SPSTEP  (1)
                                    10 SINPGL  (1)             11 COSPGL  (1)             12 TMP      (40)
                                    52 NTMP    (1)             53 NPGL    (1)             54 RELAREA(1)
                                    55 PGL     (40)            95 WHERE   (50)           145 IPOW     (1)
                                   146 TER      (4000)       4146 TLSTART(2)            4148 TLSTOP  (2)
                                  4150 FILLNET(1)            4151 CUTNET  (1)           4152 CUTCOST(1)
                                  4153 FILCOST(1)            4154 ECOST   (1)           4155 ELIMHI  (1)
                                  4156 ELIMLO  (1)
      TSV              6             0 THCK    (1)              1 ERCOST  (1)              2 PSTEP   (1)
                                     3 FILPRCE(1)               4 CUTPRCE(1)               5 NERTH   (1)
      TMPL             4             0 IND     (1)              1 SWID    (1)              2 TWOCL   (1)
                                     3 JACK    (1)
      ZONES           74             0 ZONSTEP(9)               9 APWID   (9)             18 APRSTR  (27)
                                    45 APREND  (27)            72 NAPR    (1)             73 APTOT   (1)

STATISTICS
  PROGRAM LENGTH               134B       92
  CM LABELED COMMON LENGTH     124B       84
  CM BLANK COMMON LENGTH     10075B     4157
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```
     SUBROUTINE ZPRICE      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE      1

 1                   SUBROUTINE ZPRICE
                     COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
                     COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
                    1OT
 5                   APVOL=APTOT=0.
                     REWIND 3
                     DO 10 IREAD=1,NAPR
                     READ (3)ARZN2
               100   READ(3)ARZN1
10                   IFL=EOF(3)
                     IF(IFL.NE.0)GO TO 400
                     VL=0.018519*(ARZN1+ARZN2)*PSTEP
                     IF(VL.LT.0.0)APVOL=APVOL+VL
                     ARZN2=ARZN1
15                   GO TO 100
               400   APVOL=ABS(APVOL)
                     APCOST=APVOL*CUTPRCE
                     WRITE(4,1000)IREAD,CUTPRCE,APVOL,APCOST
              1000   FORMAT("1" 50X"APPROACH ZONE NUMBER ",I1//5X, "THE ESTIMATED COST
20                  1PER CUBIC YARD OF CUT IS $"F7.3,12X,"THE NET VOLUME OF CUT IS "F10
                    2.0,"CUBIC YARDS"//35X,"THE ESTIMATED COST OF CUT IS $",F13.2)
                     APTOT =APTOT+APCOST
               10    CONTINUE
                     WRITE(4,2000)NAPR,APTOT
25            2000   FORMAT("1" 35X"THE TOTAL COST OF ",I1," APPROACH ZONES IS $"F13.2)
                     RETURN
                     END


     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    2  ZPRICE          1           26

VARIABLES       SN  TYPE            RELOCATION
  153  APCOST       REAL                                 REFS        18        22   DEFINED        17
   55  APREND       REAL       ARRAY     ZONES           REFS         3
   22  APRSTR       REAL       ARRAY     ZONES           REFS         3
  111  APTOT        REAL                 ZONES           REFS         3        22        24   DEFINED         5        22
  145  APVOL        REAL                                 REFS        13        16        17        18   DEFINED         5        13
                                                           16
   11  APWID        REAL       ARRAY     ZONES           REFS         3
  150  ARZN1        REAL                                 REFS        12        14   DEFINED         9
  147  ARZN2        REAL                                 REFS        12   DEFINED         8        14
    4  CUTPRCE      REAL                 TSV             REFS         2        17        18
    1  ERCOST       REAL                 TSV             REFS         2
    3  FILPRCE      REAL                 TSV             REFS         2
  151  IFL          INTEGER                              REFS        11   DEFINED        10
  146  IREAD        INTEGER                              REFS        18   DEFINED         7
  110  NAPR         INTEGER              ZONES           REFS         3         7        24
    5  NERTH        INTEGER              TSV             REFS         2
    2  PSTEP        REAL                 TSV             REFS         2        12
    0  THCK         REAL                 TSV             REFS         2
  152  VL           REAL                                 REFS      2*13   DEFINED        12
```

```
        SUBROUTINE ZPRICE      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE              RELOCATION
    0  ZONSTEP    REAL         ARRAY     ZONES          REFS         3

FILE NAMES          MODE
        TAPE3      UNFMT                         READS          8          9     MOTION         6
        TAPE4      FMT                          WRITES         18         24

EXTERNALS            TYPE    ARGS        REFERENCES
        EOF         REAL       1             10

INLINE FUNCTIONS    TYPE    ARGS          DEF LINE  REFERENCES
        ABS         REAL       1  INTRIN                  16

STATEMENT LABELS                  DEF LINE   REFERENCES
    0  10                            23          7
   14  100                            9         15
   37  400                           16         11
  101  1000     FMT                  19         18
  133  2000     FMT                  25         24

LOOPS  LABEL     INDEX      FROM-TO    LENGTH    PROPERTIES
   11  10      * IREAD        7 23        43B                  EXT REFS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
        TSV          6                 0 THCK     (1)                1 ERCOST (1)                 2 PSTEP  (1)
                                       3 FILPRCE(1)                  4 CUTPRCE(1)                 5 NERTH  (1)
        ZONES       74                 0 ZONSTEP(9)                  9 APWID   (9)               18 APRSTR (27)
                                      45 APREND (27)                72 NAPR    (1)               73 APTOT  (1)

STATISTICS
  PROGRAM LENGTH                   154B     108
  CM LABELED COMMON LENGTH         120B      80
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      PROGRAM FROST       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     1

            OVERLAY(LIFE,5,0)
            PROGRAM FROST
            COMMON/BLOCKA/KWITCHS(20)
            COMMON/BLOCKB/COMPF,COMPR,FCOMPF,FCOMPR,SLSDBTF,
           1    SLSDBTR,SLSPENF,SLSPENR,FLSF,FLSR,RSUBF,RSUBR,
           2    FRSUBF,FRSUBR,PRDBTF,PRFLTF,PRDBTR,PRFLTR,XTRA
            COMMON/BLOCKC/MSGSW1,IIPAVT,MESS(11),ISWITF,ISWITR,MSGSW2,MSGSW3
            COMMON/BLOCKD/PVTFLX,PVTRGD,IFLEXNA,IRIGDNA
            COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
           1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
           2    ISUBBOR,BMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
            COMMON /LCY/ AXK,YK,TRY(20),FAC,LS,XCBR,XSTR
            COMMON /NBLK/ NOGQ,NOH,NPTQ,NXQ,NYQ,NODQ,NOSGQ,XK
            COMMON/RESTR/IREST,JREST
      *     ALL WRITES ARE (I,XXXX )    I IS ON NEXT LINE
            I=9
            DO 115 J = 1,20
            KWITCHS(J) = 0
        115 CONTINUE
            READ(3,9110)DESIGN,ICONFIG,IFIL,TRAFF,DFI,TDFP,IPAVT,
           1    FLEXPT,OVR,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
           2    ISUBBOR,BMOIST,DRYWT,CBR8,CBR10,COMS
            IF (DESIGN .EQ. 0.)  GO TO 9900
      C     LIFE2 DEFAULT VALUES
            IPAVT = 4-IREST
            FLEXPT = 6.0
            OVR = 1H
            RIGDPT = 6.0
            SUBMOD = XK
            ISUBCBR = IFIX(XCBR + .001)
            CBR8=1HX
        120 CALL PURIFY
            CALL OUTA (I)
            DO 125 J = 1,19
            IF (KWITCHS(J) .EQ. 1)  GO TO 130
        125 CONTINUE
            GO TO 140
        130 CALL OUTB (I)
            GO TO 9900
        140 CALL FREEZE
            CALL OUTC (I)
       9110 FORMAT(6X,F6.0,I1,I1,A1,1X,F5.0,F3.0,I1,F2.0,A1,F2.0,A1,
           1    I1,F2.0,F3.0,I2,I1,F2.0,F3.0,A1,A1,3A10,A3)
       9900 CONTINUE
            END


   SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    3  FROST            2
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         PROGRAM FROST      74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE     2

VARIABLES      SN  TYPE              RELOCATION
     10  AMINOR    REAL                KARD      REFS        9  DEFINED       20
      0  AXK       REAL                LCY       REFS       12
     16  BMOIST    REAL                KARD      REFS        9  DEFINED       20
     21  CBR10     REAL                KARD      REFS        9  DEFINED       20
     20  CBR8      REAL                KARD      REFS        9  DEFINED       20        31
      0  COMPF     REAL                BLOCKB    REFS        4
      1  COMPR     REAL                BLOCKB    REFS        4
     22  COMS      REAL      ARRAY     KARD      REFS        9  DEFINED       20
      0  DESIGN    REAL                KARD      REFS        9      23    DEFINED       20
      3  DFI       REAL                KARD      REFS        9  DEFINED       20
     17  DRYWT     REAL                KARD      REFS        9  DEFINED       20
     26  FAC       REAL                LCY       REFS       12
      2  FCOMPF    REAL                BLOCKB    REFS        4
      3  FCOMPR    REAL                BLOCKB    REFS        4
      6  FLEXPT    REAL                KARD      REFS        9  DEFINED       20        26
     10  FLSF      REAL                BLOCKB    REFS        4
     11  FLSR      REAL                BLOCKB    REFS        4
     14  FRSUBF    REAL                BLOCKB    REFS        4
     15  FRSUBR    REAL                BLOCKB    REFS        4
    143  I         INTEGER                       REFS       33      38        41  DEFINED       16
      1  ICONFIG   INTEGER             KARD      REFS        9  DEFINED       20
     11  IFGRP     INTEGER             KARD      REFS        9  DEFINED       20
    145  IFIL    * INTEGER                     DEFINED      20
      2  IFLEXNA   INTEGER             BLOCKD    REFS        8
      1  IIPAVT    INTEGER             BLOCKC    REFS        7
      5  IPAVT     INTEGER             KARD      REFS        9  DEFINED       20        25
      0  IREST     INTEGER             RESTR     REFS       14      25
      3  IRIGDNA   INTEGER             BLOCKD    REFS        8
     14  ISUBCBR   INTEGER             KARD      REFS        9  DEFINED       20        30
     15  ISUBHOR   INTEGER             KARD      REFS        9  DEFINED       20
     15  ISWITF    INTEGER             BLOCKC    REFS        7
     16  ISWITR    INTEGER             BLOCKC    REFS        7
    144  J         INTEGER                       REFS       18      35    DEFINED       17        34
      1  JREST     INTEGER             RESTR     REFS       14
      0  KWITCHS   INTEGER   ARRAY     BLOCKA    REFS        3      35    DEFINED       18
     26  LCIND     INTEGER             KARD      REFS        9
     27  LS        INTEGER             LCY       REFS       12
      2  MESS      INTEGER   ARRAY     BLOCKC    REFS        7
      0  MSGSW1    INTEGER             BLOCKC    REFS        7
     17  MSGSW2    INTEGER             BLOCKC    REFS        7
     20  MSGSW3    INTEGER             BLOCKC    REFS        7
      5  NODQ      INTEGER             NBLK      REFS       13
      0  NOGQ      INTEGER             NBLK      REFS       13
      1  NOH       INTEGER             NBLK      REFS       13
      6  NOSGQ     INTEGER             NBLK      REFS       13
      2  NPTQ      INTEGER             NBLK      REFS       13
      3  NXQ       INTEGER             NBLK      REFS       13
      4  NYQ       INTEGER             NBLK      REFS       13
     27  OVR       REAL                KARD      REFS        9  DEFINED       20        27
     16  PRDBTF    REAL                BLOCKB    REFS        4
     20  PRDBTR    REAL                BLOCKB    REFS        4
     17  PRFLTF    REAL                BLOCKB    REFS        4
     21  PRFLTR    REAL                BLOCKB    REFS        4
      0  PVTFLX    REAL                BLOCKD    REFS        8
      1  PVTRGD    REAL                BLOCKD    REFS        8
      7  RIGOPT    REAL                KARD      REFS        9  DEFINED       20        28
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                PROGRAM FROST       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420        09/02/77  13.54.00        PAGE     3

   VARIABLES        SN  TYPE                  RELOCATION
      12  RSUBF         REAL                       BLOCKB        REFS         4
      13  RSUBR         REAL                       BLOCKB        REFS         4
       4  SLSDBTF       REAL                       BLOCKB        REFS         4
       5  SLSDBTR       REAL                       BLOCKB        REFS         4
       6  SLSPENF       REAL                       BLOCKB        REFS         4
       7  SLSPENR       REAL                       BLOCKB        REFS         4
      12  SMOIST        REAL                       KARD          REFS         9    DEFINED       20
      13  SUBMOD        REAL                       KARD          REFS         9    DEFINED       20        29
       4  TDFP          REAL                       KARD          REFS         9    DEFINED       20
       2  TRAFF         REAL                       KARD          REFS         9    DEFINED       20
       2  TRY           REAL           ARRAY       LCY           REFS        12
      30  XCBR          REAL                       LCY           REFS        12         30
       7  XK            REAL                       NBLK          REFS        13         29
      31  XSTR          REAL                       LCY           REFS        12
      22  XTRA          REAL                       BLOCKB        REFS         4
       1  YK            REAL                       LCY           REFS        12

   FILE NAMES           MODE
         TAPE3          FMT                          READS        20

   EXTERNALS            TYPE      ARGS        REFERENCES
           FREEZE                   0            40
           OUTA                     1            33
           OUTB                     1            38
           OUTC                     1            41
           PURIFY                   0            32

   INLINE FUNCTIONS     TYPE      ARGS           DEF LINE   REFERENCES
           IFIX         INTEGER     1   INTRIN                  30

   STATEMENT LABELS                         DEF LINE    REFERENCES
       0  115                                  19           17
       0  120              INACTIVE            32
       0  125
      57  130                                  36           34
      63  140                                  38           35
     124  9110       FMT                       40           37
      67  9900                                 42           20
                                               44           23          39

   LOOPS  LABEL       INDEX          FROM-TO      LENGTH      PROPERTIES
      10  115           J              17 19          5B        INSTACK
      47  125         * J              34 36          6B        INSTACK     EXITS

   COMMON BLOCKS      LENGTH       MEMBERS - BIAS NAME(LENGTH)
          BLOCKA         20                 0 KWITCHS(20)
          BLOCKB         19                 0 COMPF   (1)           1 COMPR   (1)             2 FCOMPF  (1)
                                            3 FCOMPR  (1)           4 SLSDBTF(1)              5 SLSDBTR(1)
                                            6 SLSPENF(1)            7 SLSPENR(1)              8 FLSF    (1)
                                            9 FLSR    (1)          10 RSUBF   (1)            11 RSUBR   (1)
                                           12 FRSUBF  (1)          13 FRSUBR  (1)            14 PROBTF  (1)
                                           15 PRFLTF  (1)          16 PROBTR  (1)            17 PRFLTR  (1)
                                           18 XTRA    (1)
          BLOCKC         17                 0 MSGSW1  (1)           1 IIPAVT  (1)             2 MESS    (11)
                                           13 ISWITF  (1)          14 ISWITR  (1)            15 MSGSW2  (1)
                                           16 MSGSW3  (1)
          BLOCKD          4                 0 PVTFLX  (1)           1 PVTRGD  (1)             2 IFLEXNA(1)
                                            3 IRIGONA(1)
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        PROGRAM FROST       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00         PAGE     4

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
      KARD          24              0 DESIGN (1)                   1 ICONFIG(1)                   2 THAFF   (1)
                                    3 DFI    (1)                   4 TDFP   (1)                   5 IPAVT   (1)
                                    6 FLEXPT (1)                   7 RIGDPT (1)                   8 AMINOR  (1)
                                    9 IFGRP  (1)                  10 SMOIST (1)                  11 SUBMOD  (1)
                                   12 ISUBCHR(1)                  13 ISUBHOR(1)                  14 BMOIST  (1)
                                   15 DRYWT  (1)                  16 CBR8   (1)                  17 CBR10   (1)
                                   18 COMS   (4)                  22 LCIND  (1)                  23 OVR     (1)
      LCY           26              0 AXK    (1)                   1 YK     (1)                   2 TRY     (20)
                                   22 FAC    (1)                  23 LS     (1)                  24 XCBR    (1)
                                   25 XSTR   (1)
      NBLK           8              0 NOGQ   (1)                   1 NOH    (1)                   2 NPTQ    (1)
                                    3 NXQ    (1)                   4 NYQ    (1)                   5 NODQ    (1)
                                    6 NOSGQ  (1)                   7 XK     (1)
      RESTR          2              0 IREST  (1)                   1 JREST  (1)

STATISTICS
  PROGRAM LENGTH                 146B      102
  CM LABELED COMMON LENGTH       170B      120
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```
      SUBROUTINE FREEZE
      COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
     1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
     2    ISUBHOR,BMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
      COMMON/FLAG/ IFLAG
      COMMON/BLOCKB/COMPF,COMPR,FCOMPF,FCOMPR,SLSDBTF,
     1    SLSUBTR,SLSPENF,SLSPENR,FLSF,FLSR,RSUBF,RSUBR,
     2    FRSUBF,FRSUBR,PRDBTF,PRFLTF,PRDBTR,PRFLTR,XTRA
      COMMON/BLOCKC/MSGSW1,IIPAVT,MESS(11),ISWITF,ISWITR,MSGSW2,MSGSW3
      COMMON/BLOCKD/PVTFLX,PVTRGD,IFLEXNA,IRIGDNA
      COMMON/BLOCKE/ ISWITX
      DIMENSION BKB(20)
      EQUIVALENCE (MESS(1),MSG1),(MESS(2),MSG2),
     1            (MESS(3),MSG3),(MESS(4),MSG4),
     2            (MESS(5),MSG5),(MESS(6),MSG6),
     3            (MESS(7),MSG7),(MESS(8),MSG8),
     4            (MESS(9),MSG9),(MESS(10),MSG10),
     5            (MESS(11),MSG11)
      MSGSW1 = 0
       MSGSW2 = 0
      MSGSW3 = 0
      XFLXPVT = 0.
      ISWITX = 0
      KFLAG = 0
      IF(ICONFIG .LE. 7) GO TO 17
      ITEST = (SHIFT(TRAFF,6).AND.77B)-33B
      IF(ITEST .GE. 0) KFLAG = 1
      IF (ITEST .EQ. 0) ITEST = 10
   17 IF (OVR .EQ. 1HX)  GO TO 9
      IF (IPAVT .EQ. 2)  GO TO 9
      XFLXPVT = FLEXPT
      IF (TRAFF .NE. 1HE) GO TO 11
      FLEXPT = 0.
      GO TO 9
   11 IF(KFLAG .NE. 1) GO TO 1
      FLEXPT = FLXPET(ITEST,CBR10)
      GO TO 9
    1 IF (ICONFIG .GT. 4)  GO TO 7
      IF (ICONFIG .GT. 2)  GO TO 3
      IF (CBR10 .EQ. 1HX .AND. TRAFF .EQ. 1HB)  GO TO 4
    2 FLEXPT = 3.
      GO TO 9
    3 IF (CBR10 .EQ. 1HX)  GO TO 6
      IF (TRAFF .EQ. 1HA)  GO TO 5
    4 FLEXPT = 4.
      GO TO 9
    5 FLEXPT = 5.
      GO TO 9
    6 IF (TRAFF .EQ. 1HA)  GO TO 4
      GO TO 2
    7 IF (CBR10 .EQ. 1HX)  GO TO 8
      IF (TRAFF .NE. 1HA)  GO TO 5
      FLEXPT = 6.
      GO TO 9
    8 IF (TRAFF .EQ. 1HA)  GO TO 5
      GO TO 4
    9 CONTINUE
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      ISWITR = 0
      SVTDFP = TDFP
      ISWITF = 0
      PVTFLX = FLEXPT
      PVTRGD = RIGDPT
       DO 10 K = 1,11
      MESS(K) = 0
   10 CONTINUE
      BKB(1)=0
      DO 20 K=1,20
      BKB(K) = 0.
   20 CONTINUE
      IIPAVT = IPAVT
  120 IF (TDFP .NE. 0. ) GO TO 1400
      IF (IPAVT .NE. 1 )  GO TO 140
  130 SAVB = DFI
      GO TO 150
  140 IF (RIGDPT .LE. 12. )  GO TO 130
      SAVA = (RIGDPT - 12. ) * 10.
      SAVB = DFI - SAVA
*
*      START  OF CALCULATIONS FOR COMPLETE PENETRATION
*
  150 IF (DRYWT .NE. 100. )  GO TO 200
      ASSIGN 170 TO MG01
      GO TO 600
  170 SVTDFP = Y
      GO TO 1400
  200 IF (DRYWT .NE. 115. )  GO TO 250
      ASSIGN 170  TO MG02
      GO TO 800
  250 IF (DRYWT .NE. 135. )  GO TO 300
      ASSIGN 170 TO MG03
      GO TO 1000
  300 IF (DRYWT .NE. 150. )  GO TO 350
      ASSIGN 170 TO MG04
      GO TO 1200
  350 IF (DRYWT .GT. 115.)  GO TO 400
      ASSIGN 370  TO MG01
      GO TO 600
  370 YX = Y
      ASSIGN 380  TO MG02
      GO TO 800
  380 YY = Y
      A = (DRYWT - 100.)/(115. - 100.)
  385 SVTDFP = YX + A * (YY - YX)
      GO TO 1400
  400 IF (DRYWT .GT. 135.)  GO TO 450
      ASSIGN 420 TO MG02
      GO TO 800
  420 YX = Y
      ASSIGN 430 TO MG03
      GO TO 1000
  430 YY = Y
      A = (DRYWT - 115. )/(135. - 115.)
      GO TO 385
  450 ASSIGN 470 TO MG03
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      GO TO 1000
  470 YX = Y
      ASSIGN 480 TO MG04
      GO TO 1200
  480 YY = Y
      A = (DRYWT - 135.)/(150. - 135.)
      GO TO 385
  600 IF (BMOIST .NE. 5.)   GO TO 650
      IF (SAVB .LE. 1000.)  GO TO 630
      IF (SAVB .LE. 3000.)  GO TO 620
      Y = (SAVB * 67/3000 ) + 32.
  610 CONTINUE
      GO TO MG01 (170,370)
  620 Y = (SAVB * 25/1000 ) + 24.
      GO TO 610
  630 Y = (SAVB * 35/1000 ) + 15.5
      GO TO 610
  650 IF (BMOIST .NE. 20.)   GO TO 700
      IF (SAVB .LE. 1000.)  GO TO 680
      IF (SAVB .LE. 2000.)  GO TO 670
      IF (SAVB .LE. 3000.)  GO TO 660
      Y = (SAVB * 17/1000 ) + 37.
      GO TO 610
  660 Y = (SAVB / 50.) + 28.
      GO TO 610
  670 Y = (SAVB * 23/1000 ) + 22.
      GO TO 610
  680 Y = (SAVB * 3.2/100.) + 12.8
      GO TO 610
  700 A = (BMOIST - 5.)/(20. - 5.)
      IF (SAVB .LE. 1000.)   GO TO 740
      IF (SAVB .LE. 2000.)   GO TO 730
      IF (SAVB .LE. 3000.)   GO TO 720
      Y1 = (SAVB * 67./3000.) + 32.
      Y2 = (SAVB * 17./1000.) + 37.
  710 Y = Y1 - A * (Y1 - Y2)
      GO TO 610
  720 Y1 = (SAVB * 25./1000.) + 24.
      Y2 = (SAVB / 50.) + 28.
      GO TO 710
  730 Y1 = (SAVB / 40.) + 24.
      Y2 = (SAVB * 23./1000.) + 22.
      GO TO 710
  740 Y1 = (SAVB * 35./1000.) + 15.5
      Y2 = (SAVB * 3.2/100.)  + 12.8
      GO TO 710
  800 IF (BMOIST .NE. 5. )  GO TO 850
      IF (SAVB  .LE. 1000.) GO TO 830
      IF (SAVB  .LE. 3000.) GO TO 820
      Y = (SAVB / 40.) + 42.
  810 CONTINUE
      GO TO MG02 (170,380,420)
  820 Y = (SAVB * 31./1000.) + 24.
      GO TO 810
  830 Y = (SAVB / 25.) + 15.
      GO TO 810
  850 IF (BMOIST .NE. 15.)   GO TO 900
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            IF (SAVB .LE. 1000.)  GO TO 880
            IF (SAVB  .LE. 2000.)  GO TO 870
            IF (SAVB .LE. 4000.)  GO TO 860
            Y = (SAVB / 50.) + 46.
            GO TO 810
        860 Y = (SAVB * 24./1000.) + 30.
            GO TO 810
        870 Y = (SAVB * .03)  + 18.
            GO TO 810
        880 Y = (SAVB * 35./1000.)  + 12.5
            GO TO 810
        900 A = (BMOIST -5.)/(15. - 5.)
            IF (SAVB .LE. 1000.)    GO TO 950
            IF (SAVB .LE. 2000.)    GO TO 940
            IF (SAVB .LE. 3000.)    GO TO 930
            IF (SAVB .LE. 4000.)    GO TO 920
            Y1 = (SAVB / 40.) + 42.
            Y2 = (SAVB / 50.) + 46.
        910 Y = Y1 - A * (Y1 - Y2)
            GO TO 810
        920 Y1 = (SAVB / 40.) + 42.
            Y2 = (SAVB * 24./1000.) + 30.
            GO TO 910
        930 Y1 = (SAVB * 31./1000.) + 24.
            Y2 = (SAVB * 24./1000.) + 30.
            GO TO 910
        940 Y1 = (SAVB * 31./1000.) + 24.
            Y2 = (SAVB * .03) + 18.
            GO TO 910
        950 Y1 = (SAVB / 25.) + 15.
            Y2 = (SAVB * 35./1000.) + 12.5
            GO TO 910
       1000 IF (BMOIST .NE. 2.)  GO TO 1050
            IF (SAVB .LE. 800.)  GO TO 1030
            IF (SAVB .LE. 2000.)  GO TO 1020
            Y = (SAVB * 77./2000.) + 31.
       1010 CONTINUE
            GO TO MG03 (170,430,470)
       1020 Y = (SAVB * 9./200.) + 18.
            GO TO 1010
       1030 Y  = (SAVB / 20.) + 14.
            GO TO 1010
       1050 IF (BMOIST .NE.  7.)  GO TO 1100
            IF (SAVB .LE. 800.)  GO TO 1080
            IF (SAVB .LE. 2000.)  GO TO 1070
            IF (SAVB .LE. 4000.)  GO TO 1060
            Y = (SAVB * 113./4000.) + 55.
            GO TO 1010
       1060 Y = (SAVB * 7./200.) + 28.
            GO TO 1010
       1070 Y = (SAVB * 31./800.) + 21.
            GO TO 1010
       1080 Y = (SAVB / 20.) + 12.
            GO TO 1010
       1100 A = (BMOIST - 2.)/(7. - 2.)
            IF (SAVB .LE. 800.)  GO TO 1140
            IF (SAVB .LE. 2000.)  GO TO 1130
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      IF (SAVB .LE. 4000.)  GO TO 1120
      Y1 = (SAVB * 77./2000.) + 31.
      Y2 = (SAVB * 113./4000.) + 55.
 1110 Y = Y1 - A * (Y1 - Y2)
      GO TO 1010
 1120 Y1 = (SAVB * 77./2000.) + 31.
      Y2 = (SAVB * 7./200.)  +28.
      GO TO 1110
 1130 Y1 = (SAVB * 9./200.) + 18.
      Y2 = (SAVB * 31./800.) + 21.
      GO TO 1110
 1140 Y1 = (SAVB / 20.) + 14.
      Y2 = (SAVB /20.) + 12.
      GO TO 1110
 1200 IF (BMOIST .NE.  2.)  GO TO 1250
      Y = (SAVB /20.) + 23.
      IF (SAVB .LE. 1000.)  Y = (SAVB * .06) + 13.
 1210 CONTINUE
      GO TO MG04 (170,480)
 1250 IF (BMOIST .NE. 5.)  GO TO 1300
      IF (SAVB .LE. 800.)  GO TO 1270
      IF (SAVB .LE. 2000.)  GO TO 1260
      Y = (SAVB / 25.) + 30.
      GO TO 1210
 1260 Y = (SAVB * 9./200.) + 20.
      GO TO 1210
 1270 Y = (SAVB * 38./700.) + 88./7.
      GO TO 1210
 1300 A = (BMOIST - 2.)/(5. - 2.)
      IF (SAVB .LE. 800.)  GO TO 1340
      IF (SAVB .LE. 1000.)  GO TO 1330
      IF (SAVB .LE. 2000.)  GO TO 1320
      Y1 = (SAVB /20.) + 23.
      Y2 = (SAVB /25.) + 30.
 1310 Y = Y1 - A * ( Y1 - Y2)
      GO TO 1210
 1320 Y1 = (SAVB /20.) + 23.
      Y2 = (SAVB * 9./200.) + 20.
      GO TO 1310
 1330 Y1 = (SAVB * .06) + 13.
      Y2 = (SAVB * 9./200.) + 20.
      GO TO 1310
 1340 Y1 = (SAVB * .06) + 13.
      Y2 = (SAVB * 38./700.) + 88./7.
      GO TO 1310
*
*      END OF CALCULATIONS FOR COMPLETE PENETRATION
*
 1400 CONTINUE
*
*     START LIMITED SUBGRADE FROST PENETRATION
*
      IF (IPAVT .EQ. 2)  GO TO 1410
      COMPF = SVTDFP - FLEXPT
      IF(SVTDFP.GE.72.) MSGSW1=1
      IFLAG=1
      CALL SUBPEN (COMPF,DBT,SFP)
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           SLSDBTF = DBT
           SLSPENF = SFP
      1410 IF (IPAVT .EQ. 1)  GO TO 1500
           IF (RIGOPT .LE. 12.) GO TO 1420
           COMPR = SVTDFP - 12.
           GO TO 1430
      1420 COMPR = SVTDFP - RIGOPT
           IF(SVTDFP.GE.72.) MSGSW1=1
     1430  IFLAG=2
           CALL SUBPEN(COMPR,DBT,SFP)
           SLSDBTR = DBT
           SLSPENR = SFP
      1500 CONTINUE
     *
     *     END LIMITED SUBGRADE FROST PENETRATION
     *
           IF (IPAVT .EQ. 1)   GO TO 1550
     *    START REDUCED SUBGRADE RIGID
           IF (ISUBHOR .EQ. 5) GO TO 1540
           IF (IFGRP .EQ. 1)   GO TO 1520
           IF (IFGRP .EQ. 2)   GO TO 1510
           RSUBR = ((22. * SUBMOD) - 50.) / 125.
           GO TO 1530
      1510 RSUBR = ((21. * SUBMOD) - 50.) / 166.
           GO TO 1530
      1520 RSUBR = ((16. * SUBMOD) - 20.) / 175.
      1530 IF (RSUBR .LT. 4.)  RSUBR = 4
           RX=RSUBR+RIGOPT
           IF(RX.GE.72.) MSGSW3=1
           A = RSUBR
           CALL RTN25(A)
           IF (RIGOPT .GT. A) MSG10 = 1
           GO TO 1550
      1540 RSUBR = 4.0
           MSG11 = 1
     *    END    REDUCED SUBGRADE   RIGID
      1550 IF (IPAVT .EQ. 2)   GO TO 1950
     *    START FLEXIBLE REDUCED SUBGRADE
           IF (KFLAG .NE. 1) GO TO 1559
           CALL RSUBG(T,IFGRP,ITEST)
           GO TO 1900
      1559 X = DESIGN
           IF (ICONFIG .EQ. 2)  GO TO 1560
           IF (TRAFF  .NE. 1HC)  GO TO 1560
           X = X * .75
      1560 IF (ICONFIG .NE. 1)  GO TO 1600
           IF (IFGRP .EQ. 1) GO TO 1580
           IF (IFGRP .EQ. 2)  GO TO 1570
           R = (ALOG10(30.)- ALOG10(11.25))/(ALOG10(30000.)- ALOG10(5000.))
           S = ALOG10(X) - ALOG10(5000.)
           T      = (R * S ) + ALOG10(11.25)
           GO TO 1900
      1570 R = (ALOG10(21.)- ALOG10(9.))/(ALOG10(30000.)- ALOG10(7000.))
           S = ALOG10(X) - ALOG10(7000.)
           T      = (R * S) + ALOG10(9.)
           GO TO 1900
      1580 R = (ALOG10(18.)- ALOG10(9.))/(ALOG10(30000.)- ALOG10(9200.))
      S = ALOG10(X) - ALOG10(9200.)
      T     = (R * S) + ALOG10(9.)
      GO TO 1900
 1600 IF (ICONFIG .NE. 2)  GO TO 1650
      IF (IFGRP .EQ. 1 )   GO TO 1620
      IF (IFGRP .EQ. 2 )   GO TO 1610
      R = (ALOG10(30.)- ALOG10(10.))/(ALOG10(30000.)- ALOG10(5000.))
      S = ALOG10(X) - ALOG10(5000.)
      T = (R * S ) + ALOG10(10.)
      GO TO 1900
 1610 R = (ALOG10(20.)- ALOG10(9.))/(ALOG10(30000.)- ALOG10(8125.))
      S = ALOG10(X) - ALOG10(8125.)
      T = (R * S) + ALOG10(9.)
      GO TO 1900
 1620 R = (ALOG10(16.5) - ALOG10(9.))/(ALOG10(30000.)- ALOG10(11900.))
      S =  ALOG10(X) - ALOG10(11900.)
      T = (R * S) + ALOG10(9.)
      GO TO 1900
 1650 IF (ICONFIG .NE. 3)  GO TO 1700
      IF (IFGRP .EQ. 1)    GO TO 1670
      IF (IFGRP .EQ. 2)    GO TO 1660
      R = (ALOG10(52.5) -ALOG10(20.))/(ALOG10(120000.)- ALOG10(30000.))
      S = ALOG10(X) - ALOG10(30000.)
      T = (R * S ) + ALOG10(20.)
      GO TO 1900
 1660 R = (ALOG10(34.3) - ALOG10(13.5))/(ALOG10(120000.)-ALOG10(30000.))
      S = ALOG10(X) - ALOG10(30000.)
      T = (R * S) + ALOG10(13.5)
      GO TO 1900
 1670 R = (ALOG10(28.5) -ALOG10(11.))/(ALOG10(120000.)- ALOG10(30000.))
      S = ALOG10(X) - ALOG10(30000.)
      T = (R * S) + ALOG10(11.)
      GO TO 1900
 1700 IF (ICONFIG .NE. 4)  GO TO 1750
      IF (IFGRP .EQ. 1)    GO TO 1720
      IF (IFGRP .EQ. 2)    GO TO 1710
      R = (ALOG10(47.)- ALOG10(20.5))/(ALOG10(90000.)- ALOG10(25000.))
      S = ALOG10(X) - ALOG10(25000.)
      T = (R * S) + ALOG10(20.5)
      GO TO 1900
 1710 R = (ALOG10(29.2) -ALOG10(13.))/(ALOG10(90000.)-  ALOG10(25000.))
      S = ALOG10(X) - ALOG10(25000.)
      T = (R * S) + ALOG10(13.)
      GO TO 1900
 1720 R = (ALOG10(23.)- ALOG10(10.))/(ALOG10(90000.)- ALOG10(25000.))
      S = ALOG10(X) - ALOG10(25000.)
      T = (R * S) +ALOG10(10.)
      GO TO 1900
 1750 IF (ICONFIG .NE. 5)  GO TO 1800
      RA = ALOG10(200000.)- ALOG10(100000.)
      S = ALOG10(X) - ALOG10(100000.)
      IF (IFGRP .EQ. 1)  GO TO 1770
      IF (IFGRP .EQ. 2)  GO TO 1760
      R = (ALOG10(77.)- ALOG10(47.5))/RA
      T = (R * S ) + ALOG10(47.5)
      GO TO 1900
 1760 R = (ALOG10(49.)- ALOG10(30.5))/RA
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      T = (R * S) + ALOG10(30.5)
      GO TO 1900
 1770 R = (ALOG10(40.)- ALOG10(24.5))/RA
      T = (R * S) + ALOG10(24.5)
      GO TO 1900
 1800 IF (ICONFIG .NE. 6)  GO TO 1850
      RA = ALOG10(200000.)- ALOG10(30000.)
      S = ALOG10(X) - ALOG10(30000.)
      IF (IFGRP .EQ. 1)  GO TO 1820
      IF (IFGRP .EQ. 2 )  GO TO 1810
      R = (ALOG10(92.)- ALOG10(28.4))/RA
      T = (R * S) + ALOG10(28.4)
      GO TO 1900
 1810 R = (ALOG10(60.)- ALOG10(18.5))/RA
      T = (R * S) + ALOG10(18.5)
      GO TO 1900
 1820 R = (ALOG10(50.)- ALOG10(15.4))/RA
      T = (R * S) + ALOG10(15.4)
      GO TO 1900
 1850 RA = ALOG10(330000.)- ALOG10(160000.)
      S = ALOG10(X) - ALOG10(160000.)
      IF (IFGRP .EQ. 1)  GO TO 1870
      IF (IFGRP .EQ. 2)  GO TO 1860
      R = (ALOG10(77.5) - ALOG10(47.5)) /RA
      T = (R * S) + ALOG10(47.5)
      GO TO 1900
 1860 R = (ALOG10(49.2) - ALOG10(30.))/RA
      T = (R * S) + ALOG10(30.)
      GO TO 1900
 1870 R = (ALOG10(41.)- ALOG10(24.5))/RA
      T = (R * S) + ALOG10(24.5)
 1900 CONTINUE
      T = 10.** T
      RSUBF = T - FLEXPT
      IF (RSUBF .LT. 4.)  GO TO 1910
      IF(T.LT.72.) GO TO 1950
      MSGSW3 = 1
      GO TO 1950
 1910 RSUBF = 4.
*     END    FLEXIBLE  REDUCED SUBGRADE
 1950 CONTINUE
*     ADJUSTMENT  FOR MINIMUM THICKNESS
      IF (IPAVT .EQ. 2)  GO TO 2300
      IF (COMPF .EQ. 0.) GO TO 2030
      X = COMPF
      ASSIGN 2000   TO  KGO
      GO TO 2200
 2000 COMPF = X
 2030 IF (SLSDHTF .EQ. 0.)  GO TO 2070
      X = SLSDHTF
      ASSIGN 2040  TO KGO
      GO TO 2200
 2040 SLSDHTF = X
 2070 IF (RSUBF .EQ. 0.)  GO TO 2300
      X = RSUBF
      ASSIGN 2080  TO KGO
      GO TO 2200
      2080 RSUBF = X
           GO TO 2300
      2200 IF (KFLAG .NE. 1) GO TO 2201
           IF (X .GE. 4) GO TO 2220
           X = 4.
           GO TO 2220
      2201 IF (ICONFIG .GT. 4) GO TO 2230
           IF (ISUBCRR .GT. 80)  GO TO 2210
           IF (X .GE. 6.)  GO TO 2220
      2210 X = 6.
      2220 CONTINUE
           GO TO KGO (2000,2040,2080)
      2230 IF (CRR10 .EQ. 1HX)  GO TO 2260
           IF (ISUBCRR .GT. 80)  GO TO 2210
           IF (TRAFF .EQ. 1HA)  GO TO 2250
           IF (TRAFF .EQ. 1HB)  GO TO 2240
           IF (TRAFF .EQ. 1HC)  GO TO 2240
           IF (X .GE. 6.)  GO TO 2220
           GO TO 2210
      2240 IF (X .GE. 8.)  GO TO 2220
           X = 8.
           GO TO 2220
      2250 IF (X .GE. 9.)  GO TO 2220
           X = 9.
           GO TO 2220
      2260 IF (ISUBCRR .GT. 80)  GO TO 2210
           IF (TRAFF .EQ. 1HA)  GO TO 2270
           IF (TRAFF .EQ. 1HB)  GO TO 2250
           IF(TRAFF .EQ. 1HC) GO TO 2250
           IF (X .GE. 6.)  GO TO 2220
           GO TO 2210
      2270 IF (X .GE. 10.) GO TO 2220
           X = 10.
           GO TO 2220
*         END OF ADJUSTMENTS
*
*          SOME ADJUSTING IS DONE IN PREFERRED CHOICE CHECK
      2300 CONTINUE
*         PREFFERRED CHOICE CHECK
           IFLEXNA = 0
           IRIGDNA = 0
      3000 IF (IPAVT .EQ. 2)  GO TO 3200
           IF (TRAFF .EQ. 1HE) GO TO 3070
           IF (IFGRP .EQ. 4)  GO TO 3040
           IF (TRAFF .EQ. 1HC ) GO TO 3030
      3005 IF (ISUBHOR .LT. 3) GO TO 3020
           IF (ISUBHOR .EQ. 5) GO TO 3020
      3010 ISWITF = 2
           IFLEXNA = 2
           GO TO 3200
      3015 ISWITF = 2
           GO TO. 3200
      3020 IFLEXNA = 6
           IF (SLSDBTF .LT. RSUBF) GO TO 3015
           ISWITF = 3
           GO TO 3200
      3030 IF (AMINOR .EQ. 1H ) GO TO 3005
      GO TO 3020
 3040 IF (ISUBHOR .EQ. 4)  GO TO 3060
      IF (TRAFF .EQ. 1HC )  GO TO 3050
      GO TO 3010
 3050 IF (AMINOR .EQ. 1H )  GO TO 3010
      GO TO 3020
 3060 ISWITF = 1
      IFLEXNA = 1
      GO TO 3200
 3070 IF (IFGRP .NE. 4)  GO TO 3090
      IF (ISUBHOR .EQ. 4)  GO TO 3060
      A = SLSDBTF * .6
      B = RSUBF * .75
C  SEE EM1110-1-306 PAGE 26 FIRST PARAGRAPH FOR NEXT IF STATEMENT
      IF (A .LT. B) A = SLSDBTF
      IF (A .LT. B) ISWITX = 1
      IF (ISUBHOR .NE. 3) GO TO 3080
      SLSDBTF = A
      RSUBF = B
      IFLEXNA = 6
      IF (SMOIST .LT. 40)  GO TO 3085
      ISWITF = 2
      GO TO 3200
 3080 ISWITF = 3
      IFLEXNA = 4
      RSUBF = RSUBF * .75
      GO TO 3200
 3085 ISWITF = 3
      GO TO 3200
 3090 IFLEXNA = 6
      IF (IFGRP .EQ. 3) GO TO 3110
      A = SLSDBTF * .4
      B = RSUBF * .75
C  SEE EM1110-1-306 PAGE 26 FIRST PARAGRAPH FOR NEXT IF STATEMENT
      IF (A .LT. B) A = SLSDBTF
      IF (A .LT. B) ISWITX = 1
      RSUBF = B
      SLSDBTF = A
      IF (A .GT. B)  GO TO 3100
      ISWITF = 2
      GO TO 3200
 3100 ISWITF = 3
      GO TO 3200
 3110 A = SLSDBTF * .6
      B = RSUBF * .75
C  SEE EM1110-1-306 PAGE 26 FIRST PARAGRAPH FOR NEXT IF STATEMENT
      IF (A .LT. B) A = SLSDBTF
      IF (A .LT. B) ISWITX = 1
      SLSDBTF = A
      RSUBF = B
      IF (A .GT. B) GO TO 3120
      ISWITF = 2
      GO TO 3200
 3120 ISWITF = 3
      GO TO 3200
 3200 IF (IPAVT .EQ. 1)  GO TO 4000
      IF (ISUBHOR .EQ. 4)  GO TO 3230
      IF (IFGRP .EQ. 4) GO TO 3220
 3210 IF (ISUBHOR .GT. 1 .AND. ISUBHOR .LT. 5) GO TO 3220
      IRIGDNA = 6
      IF (SLSDBTR .LT. RSUBR) GO TO 3225
      ISWITR = 3
      GO TO 4000
 3220 ISWITR = 2
      IRIGDNA = 2
      GO TO 4000
 3225 ISWITR = 2
      GO TO 4000
 3230 IF (IFGRP .NE. 4)  GO TO 3210
      ISWITR = 1
      IRIGDNA = 1
      GO TO 4000
*    END OF PREFERRED CHOICE CHECK
*    ROUTINE  FOR 0.25 ROUNDING
 4000 A = COMPF
      CALL RTN25(A)
      COMPF = A
      A = COMPR
      CALL RTN25(A)
      COMPR = A
      A = SLSDBTF
      CALL RTN25(A)
      SLSDBTF = A
      A = SLSDBTR
      CALL RTN25(A)
      SLSDBTR = A
      A = RSUBF
      CALL RTN25(A)
      RSUBF = A
      A = RSUBR
      CALL RTN25(A)
      RSUBR = A
      A = SLSPENF
      CALL RTN25(A)
      SLSPENF = A
      A = SLSPENR
      CALL RTN25(A)
      SLSPENR = A
*    END ROUNDING ROUTINE
*    CHECK FOR FILTER
      IF (IPAVT .EQ. 2)  GO TO 4010
      FCOMPF = 4.
      COMPF = COMPF - 4.
      FLSF = 4.
      SLSDBTF = SLSDBTF - 4.
      FRSUBF = 4.
      RSUBF = RSUBF - 4.
 4010 IF (IPAVT .EQ. 1)  GO TO 4050
      FCOMPR = 4.
      COMPR = COMPR - 4.
      FLSR = 4.
      SLSDBTR = SLSDBTR - 4.
      IF (RSUBR .LT. 9.) GO TO 4020
      FRSUBR = 4.
      RSUBR = RSUBR - 4.
      GO TO 4050
 4020 FRSUBR = RSUBR
      RSUBR = 0.
 4050 CONTINUE
*     END OF FILTER CHECK
*     MESSAGE SECTION
 5000 MSG6 = 1
      MSG7 = 1
      IF((MSG10.EQ.1).O.(MSG11.EQ.1)) GO TO 5005
 5001 IF (ISWITR .EQ. ISWITF) GO TO 5030
      IF (ISWITR .EQ. 0  .OR.  ISWITR .EQ. 1)  GO TO 5010
      IF (ISWITR .EQ. 2)  GO TO 5230
      ASSIGN 5010 TO MSG01
      GO TO 5100
 5005 IF((IFGRP.EQ.4).O.(ISUBHOR.NE.5)) GO TO 5001
      ISWITR = 4
      GO TO 5001
 5010 IF (ISWITF .EQ. 0 .OR. ISWITF .EQ. 1)   GO TO 5020
      IF (ISWITF .EQ. 3)  GO TO 5240
      ASSIGN  5020 TO MSG02
      GO TO 5200
 5020 CONTINUE
      GO TO 6000
 5030 IF (ISWITR .EQ. 0 .OR.  ISWITR .EQ. 1)  GO TO 5020
      IF (ISWITR .EQ. 2)  GO TO 5040
      ASSIGN 5020  TO MSG01
      GO TO 5100
 5040 ASSIGN 5020  TO MSG02
      GO TO 5200
 5100 IF (IFGRP .LT. 4)  MSG1 = 1
      IF (TRAFF .EQ. 1HE)  MSG3 = 1
      GO TO MSG01 (5010,5020)
 5200 IF (MSGSW2 .EQ. 1 .AND. IPAVT .EQ. 2)  MSG2 = 1
      IF (TRAFF .NE. 1HE)  GO TO 5210
      IF (ISWITX .EQ. 1) GO TO 5210
      IF (IFGRP .EQ. 3)  MSG4 = 1
      IF (IFGRP .EQ. 2 .OR. IFGRP .EQ. 1)  MSG5 = 1
 5210 IF (IFGRP .LT. 3)  GO TO 5220
      IF (ISUBHOR .EQ. 1)  GO TO 5220
      MSG8 = 1
      IF (ISUBHOR .NE. 4)  GO TO 5220
      MSG9 = 1
 5220 CONTINUE
      GO TO MSG02 (5010,5020)
 5230 ASSIGN  5010  TO MSG02
      GO TO 5200
 5240 ASSIGN  5020  TO MSG01
      GO TO 5100
*     END MESSAGE SECTION
 6000 CONTINUE
      IF (ISWITF .EQ. 0)    GO TO 6030
      IF (ISWITF .EQ. 1)    GO TO 6020
      IF (ISWITF .EQ. 2)   GO TO 6010
      PRDHTF = RSUBF
      PRFLTF = FRSUBF
      GO TO 6030
      SUBROUTINE FREEZE      74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00         PAGE    13

685             6010 PRDBTF = SLSDBTF
                     PRFLTF  = FLSF
                     GO TO 6030
                6020 PRDBTF  = COMPF
                     PRFLTF = FCOMPF
690             6030 IF (ISWITR .EQ. 0)    GO TO 7000
                     IF (ISWITR .EQ. 1)     GO TO 6050
                     IF (ISWITR .EQ. 2)     GO TO 6040
                     IF (ISWITR .NE. 3) GO TO 7000
                     PRDBTR = RSUBR
695                  PRFLTR = FRSUBR
                     GO TO 7000
                6040 PRDBTR = SLSDBTR
                     PRFLTR  = FLSR
                     GO TO 7000
700             6050 PRDBTR  = COMPR
                     PRFLTR  = FCOMPR
                7000 CONTINUE
                     XTRA = 0.
                     IF (OVR .EQ. 1HX) GO TO 9000
705                  IF (IPAVT .EQ. 2)  GO TO 9000
                     A = PRDBTF * PRFLTF * FLEXPT
                     IF (A .LT. XFLXPVT)  XTRA = 1.
                9000 CONTINUE
                     RETURN
710                  END


      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     2  FREEZE          1          709

 VARIABLES       SN  TYPE            RELOCATION
  4213  A            REAL                          REFS       103       150       190       232       263       316       317
                                                    528       529       531       548       549       551       552       560
                                                    561       562       564       589       590       592       593       595
                                                    596       598       599       601       602       604       605       607
                                                    608       610       611       707   DEFINED       102       112       120
                                                    144       183       226       257       315       525       528       545
                                                    548       557       560       588       591       594       597       600
                                                    603       606       609       706
    10  AMINOR       REAL                 KARD     REFS         2       513       518
  4227  B            REAL                          REFS       528       529       532       548       549       550       552
                                                    560       561       563       564   DEFINED       526       546       558
  4232  BKB          REAL         ARRAY            REFS        12   DEFINED        66        68
    16  BMOIST       REAL                 KARD     REFS         2       122       132       144       161       171       183
                                                    204       214       226       243       248       257
    21  CBR10        REAL                 KARD     REFS         2        36        40        43        51       469
    20  CBR8         REAL                 KARD     REFS         2
     0  COMPF        REAL                 BLOCKB   REFS         6       285       443       444       588       616       688
                                                DEFINED       282       447       590       616
     1  COMPR        REAL                 BLOCKB   REFS         6       295       591       623       700
                                                DEFINED       290       292       593       623
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          SUBROUTINE FREEZE      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE    14
 VARIABLES        SN  TYPE              RELOCATION
    22  COMS          REAL         ARRAY   KARD        REFS        2
  4216  DHT           REAL                             REFS      285       286       295       296
     0  DESIGN        REAL                 KARD        REFS        2       327
     3  DFI           REAL                 KARD        REFS        2        73        77
    17  DRYWT         REAL                 KARD        REFS        2        81        86        89        92        95       102
                                                        105      112       120
     2  FCOMPF        REAL                 BLOCKB      REFS        6       689   DEFINED       615
     3  FCOMPR        REAL                 BLOCKB      REFS        6       701   DEFINED       622
     6  FLEXPT        REAL                 KARD        REFS        2        31        61       282       433       706
                                                    DEFINED       33        36        41        45        47        53
    10  FLSF          REAL                 BLOCKB      REFS        6       686   DEFINED       617
    11  FLSR          REAL                 BLOCKB      REFS        6       698   DEFINED       624
    14  FRSUBF        REAL                 BLOCKB      REFS        6       683   DEFINED       619
    15  FRSUBR        REAL                 BLOCKB      REFS        6       695   DEFINED       627       630
     1  ICONFIG       INTEGER              KARD        REFS        2        25        38        39       328       331       346
                                                        361      376       391       405       463
    11  IFGRP         INTEGER              KARD        REFS        2       305       306       325       332       333       347
                                                        348      362       363       377       378       394       395       408
                                                        409      421       422       500       523       544       571       582
                                                        643      658       664     2*665       666
     0  IFLAG         INTEGER              FLAG        REFS        5   DEFINED       284       294
     2  IFLEXNA       INTEGER              BLOCKD      REFS       10   DEFINED       496       505       509       521       533
                                                        538      543
     1  IIPAVT        INTEGER              BLOCKC      REFS        9   DEFINED
     5  IPAVT         INTEGER              KARD        REFS        2        30        70        72       281       288       302
                                                        322      442       498       569       614       621       661       705
     3  IRIGONA       INTEGER              BLOCKD      REFS       10   DEFINED       497       573       578       584
    14  ISUBCBR       INTEGER              KARD        REFS        2       464       470       482
    15  ISUBHOR       INTEGER              KARD        REFS        2       304       502       503       515       524       530
                                                        570    2*572       643       667       669
    15  ISWITF        INTEGER              BLOCKC      REFS        9       638     2*646       647       679       680       681
                                                    DEFINED       60       504       507       511       520       535       537
                                                        541      553       555       565       567
    16  ISWITR        INTEGER              BLOCKC      REFS        9       638     2*639       640     2*652       653       690
                                                        691      692       693   DEFINED        58       575       577       580
                                                        583      644
     0  ISWITX        INTEGER              BLOCKE      REFS       11       663   DEFINED        23       529       549       561
  4177  ITEST         INTEGER                          REFS       27        28        36       325   DEFINED        26        28
  4201  K             INTEGER                          REFS       64        68   DEFINED        63        67
  4176  KFLAG         INTEGER                          REFS       35       324       456   DEFINED        24        27
  4226  KGO           INTEGER                          REFS      468   DEFINED       445       450       455
    26  LCIND         INTEGER              KARD        REFS        2
     2  MESS          INTEGER      ARRAY   BLOCKC      REFS        9     11*13   DEFINED        64
  4204  MG01          INTEGER                          REFS      127   DEFINED        82        96
  4206  MG02          INTEGER                          REFS      166   DEFINED        87        99       106
  4207  MG03          INTEGER                          REFS      209   DEFINED        90       109       114
  4210  MG04          INTEGER                          REFS      247   DEFINED        93       117
     0  MSGSW1        INTEGER              BLOCKC      REFS        9   DEFINED        19       283       293
    17  MSGSW2        INTEGER              BLOCKC      REFS        9       661   DEFINED        20
    20  MSGSW3        INTEGER              BLOCKC      REFS        9   DEFINED        21       314       436
  4230  MSG01         INTEGER                          REFS      660   DEFINED       641       654       675
  4231  MSG02         INTEGER                          REFS      672   DEFINED       648       656       673
     2  MSG1          INTEGER              BLOCKC      REFS       13   DEFINED       658
    13  MSG10         INTEGER              BLOCKC      REFS       13       637   DEFINED       317
    14  MSG11         INTEGER              BLOCKC      REFS       13       637   DEFINED       320
     3  MSG2          INTEGER              BLOCKC      REFS       13   DEFINED       661
     4  MSG3          INTEGER              BLOCKC      REFS       13   DEFINED       659
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VARIABLES       SN  TYPE               RELOCATION
    5  MSG4         INTEGER               BLOCKC        REFS       13  DEFINED      664
    6  MSG5         INTEGER               BLOCKC        REFS       13  DEFINED      665
    7  MSG6         INTEGER               BLOCKC        REFS       13  DEFINED      635
   10  MSG7         INTEGER               BLOCKC        REFS       13  DEFINED      636
   11  MSG8         INTEGER               BLOCKC        REFS       13  DEFINED      668
   12  MSG9         INTEGER               BLOCKC        REFS       13  DEFINED      670
   27  OVR          REAL                  KARD          REFS        2       29      704
   16  PRDBTF       REAL                  BLOCKB        REFS        6      706  DEFINED      682      685      688
   20  PRDBTR       REAL                  BLOCKB        REFS        6  DEFINED      694      697      700
   17  PRFLTF       REAL                  BLOCKB        REFS        6      706  DEFINED      683      686      689
   21  PRFLTR       REAL                  BLOCKB        REFS        6  DEFINED      695      698      701
    0  PVTFLX       REAL                  BLOCKD        REFS       10  DEFINED       61
    1  PVTRGD       REAL                  BLOCKD        REFS       10  DEFINED       62
 4223  R            REAL                                REFS      336      340      344      351      355      359      366
                                                         370      374      381      385      389      397      400      403
                                                         411      414      417      424      427      430
                                                     DEFINED      334      338      342      349      353      357      364
                                                         368      372      379      383      387      396      399      402
                                                         410      413      416      423      426      429
 4225  RA           REAL                                REFS      396      399      402      410      413      416      423
                                                         426      429  DEFINED      392      406      419
    7  RIGOPT       REAL                  KARD          REFS        2       62       75       76      289      292      313
                                                         317
   12  RSUBF        REAL                  BLOCKB        REFS        6      434      453      454      510      526      539
                                                         546      558      600      620      682  DEFINED      433      438
                                                         457      532      539      550      563      602      620
   13  RSUBR        REAL                  BLOCKB        REFS        6      312      313      315      574      603      626
                                                         628      630      694  DEFINED      307      309      311      312
                                                         319      605      628      631
 4220  RX           REAL                                REFS      314  DEFINED      313
 4224  S            REAL                                REFS      336      340      344      351      355      359      366
                                                         370      374      381      385      389      397      400      403
                                                         411      414      417      424      427      430
                                                     DEFINED      335      339      343      350      354      358      365
                                                         369      373      380      384      388      393      407      420
 4203  SAVA         REAL                                REFS       77  DEFINED       76
 4202  SAVB         REAL                                REFS      123      124      125      128      130      133      134
                                                         135      136      138      140      142      145      146      147
                                                         148      149      152      153      155      156      158      159
                                                         162      163      164      167      169      172      173      174
                                                         175      177      179      181      184      185      186      187
                                                         188      189      192      193      195      196      198      199
                                                         201      202      205      206      207      210      212      215
                                                         216      217      218      220      222      224      227      228
                                                         229      230      231      234      235      237      238      240
                                                         241      244    2*245      249      250      251      253      255
                                                         258      259      260      261      262      265      266      268
                                                         269      271      272  DEFINED       73       77
 4217  SFP          REAL                                REFS      285      287      295      297
    4  SLSDBTF      REAL                  BLOCKB        REFS        6      448      449      510      525      528      545
                                                         548      557      560      594      618      685
                                                     DEFINED      286      452      531      551      562      596      618
    5  SLSDBTR      REAL                  BLOCKB        REFS        6      574      597      625      697
                                                     DEFINED      296      599      625
    6  SLSPENF      REAL                  BLOCKB        REFS        6      606  DEFINED      287      608
    7  SLSPENR      REAL                  BLOCKB        REFS        6      609  DEFINED      297      611
   12  SMOIST       REAL                  KARD          REFS        2      534
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        SUBROUTINE FREEZE      74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420          09/02/77  13.54.00        PAGE    16
VARIABLES       SN  TYPE                    RELOCATION
   13  SUBMOD      REAL                     KARD           REFS        2      307      309      311
 4200  SVTDFP      REAL                                    REFS      282      283      290      292      293
                                                        DEFINED       59       84      103
 4221  T           REAL                                    REFS      325      432      433      435  DEFINED      336      340
                                                            344      351      355      359      366      370      374      381
                                                            385      389      397      400      403      411      414      417
                                                            424      427      430      432
    4  TDFP        REAL                     KARD           REFS        2       59       71
    2  TRAFF       REAL                     KARD           REFS        2       26       32       40       44       49       52
                                                             55      329      471      472      473      483      484      485
                                                            499      501      516      659      662
 4222  X           REAL                                    REFS      330      335      339      343      350      354      358
                                                            365      369      373      380      384      388      393      407
                                                            420      447      452      457      460      465      474      476
                                                            479      486      488  DEFINED      327      330      444      449
                                                            454      461      466      477      480      489
 4175  XFLXPVT     REAL                                    REFS      707  DEFINED       22       31
   22  XTRA        REAL                     BLOCKB         REFS        6  DEFINED      703      707
 4205  Y           REAL                                    REFS       84       98      101      108      111      116      119
                                                        DEFINED      125      128      130      136      138      140      142
                                                            150      164      167      169      175      177      179      181
                                                            190      207      210      212      218      220      222      224
                                                            232      244      245      251      253      255      263
 4211  YX          REAL                                    REFS    2*103  DEFINED       98      108      116
 4212  YY          REAL                                    REFS      103  DEFINED      101      111      119
 4214  Y1          REAL                                    REFS    2*150    2*190    2*232    2*263  DEFINED      148      152
                                                            155      158      188      192      195      198      201      230
                                                            234      237      240      261      265      268      271
 4215  Y2          REAL                                    REFS      150      190      232      263  DEFINED      149      153
                                                            156      159      189      193      196      199      202      231
                                                            235      238      241      262      266      269      272
EXTERNALS             TYPE    ARGS           REFERENCES
      ALOG10          REAL      1 LIBRARY    4*334    2*335      336    4*338    2*339      340    4*342    2*343      344
                                             4*349    2*350      351    4*353    2*354      355    4*357    2*358      359
                                             4*364    2*365      366    4*368    2*369      370    4*372    2*373      374
                                             4*379    2*380      381    4*383    2*384      385    4*387    2*388      389
                                             2*392    2*393    2*396      397    2*399      400    2*402      403    2*406
                                             2*407    2*410      411    2*413      414    2*416      417    2*419    2*420
                                             2*423      424    2*426      427    2*429      430
      FLXPET          REAL      2               36
      RSUBG                     3              325
      RTN25                     1              316      589      592      595      598      601      604      607      610
      SUBPEN                    3              285      295
INLINE FUNCTIONS      TYPE    ARGS             DEF LINE  REFERENCES
      SHIFT          NO TYPE    2  INTRIN                     26
STATEMENT LABELS                            DEF LINE  REFERENCES
   62  1                                       38       35
   76  2                                       41       50
  102  3                                       43       39
  110  4                                       45       40       49       56
  114  5                                       47       44       52       55
  120  6                                       49       43
  124  7                                       51       38
  135  8                                       55       51
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       SUBROUTINE FREEZE       74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420         09/02/77  13.54.00        PAGE    17

STATEMENT LABELS             DEF LINE    REFERENCES
  141  9                         57        29        30        34        37        42        46        48        54
    0  10                        65        63
   53  11                        35        32
   35  17                        29        25
    0  20                        69        67
    0  120     INACTIVE          71
  203  130                       73        75
  207  140                       75        72
  221  150                       81        74
  227  170                       84        82        87        90        93       127       166       209       247
  233  200                       86        81
  241  250                       89        86
  247  300                       92        89
  255  350                       95        92
  263  370                       98        96       127
  271  380                      101        99       166
  300  385                      103       113       121
  306  400                      105        95
  314  420                      108       106       166
  322  430                      111       109       209
  332  450                      114       105
  335  470                      116       114       209
  343  490                      119       117       247
  353  600                      122        83        97
  370  610                      126       129       131       137       139       141       143       151
  373  620                      128       124
  401  630                      130       123
  407  650                      132       122
  430  660                      138       135
  435  670                      140       134
  443  690                      142       133
  450  700                      144       132
  475  710                      150       154       157       160
  503  720                      152       147
  514  730                      155       146
  525  740                      158       145
  535  800                      161        88       100       107
  553  810                      165       168       170       176       178       180       182       191
  556  820                      167       163
  563  830                      169       162
  570  850                      171       161
  611  860                      177       174
  615  870                      179       173
  623  880                      181       172
  630  900                      183       171
  660  910                      190       194       197       200       203
  665  920                      192       187
  677  930                      195       186
  710  940                      198       185
  721  950                      201       184
  732  1000                     204        91       110       115
  747  1010                     208       211       213       219       221       223       225       233
  752  1020                     210       206
  757  1030                     212       205
  764  1050                     214       204
 1005  1060                     220       217
 1012  1070                     222       216
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        SUBROUTINE FREEZE        74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE    18

  STATEMENT LABELS                      DEF LINE   REFERENCES
   1017  1080                              224        215
   1024  1100                              226        214
   1051  1110                              232        236        239        242
   1057  1120                              234        229
   1070  1130                              237        228
   1101  1140                              240        227
   1112  1200                              243         94        118
   1126  1210                              246        252        254        256        264
   1131  1250                              248        243
   1147  1260                              253        250
   1154  1270                              255        249
   1161  1300                              257        248
   1206  1310                              263        267        270        273
   1214  1320                              265        260
   1225  1330                              268        259
   1236  1340                              271        258
   1247  1400                              277         71         85        104
   1272  1410                              288        281
   1304  1420                              292        289
   1313  1430                              294        291
   1323  1500                              298        288
   1345  1510                              309        306
   1353  1520                              311        305
   1360  1530                              312        308        310
   1405  1540                              319        304
   1412  1550                              322        302        318
   1423  1559                              327        324
   1436  1560                              331        328        329
   1477  1570                              338        333
   1530  1580                              342        332
   1561  1600                              346        331
   1622  1610                              353        348
   1653  1620                              357        347
   1704  1650                              361        346
   1745  1660                              368        363
   1776  1670                              372        362
   2027  1700                              376        361
   2070  1710                              383        378
   2121  1720                              387        377
   2152  1750                              391        376
   2214  1760                              399        395
   2232  1770                              402        394
   2250  1800                              405        391
   2312  1810                              413        409
   2330  1820                              416        408
   2346  1850                              419        405
   2406  1860                              426        422
   2424  1870                              429        421
   2441  1900                              431        326        337        341        345        352        356        360        367        371
                                                      375        382        386        390        398        401        404        412        415
                                                      418        425        428
   2461  1910                              438        434
   2464  1950                              440        322        435        437
   2477  2000                              447        445        468
   2502  2030                              448        443
   2511  2040                              452        450        468
   2514  2070                              453        448
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       SUBROUTINE FREEZE     74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00       PAGE    19

STATEMENT LABELS             DEF LINE   REFERENCES
 2523  2080                    457       455       468
 2527  2200                    459       446       451       456
 2540  2201                    463       459
 2551  2210                    466       464       470       475       482       487
 2554  2220                    467       460       462       465       474       476       478       479       481       486
                                         488       490
 2557  2230                    469       463
 2602  2240                    476       472       473
 2610  2250                    479       471       484       485
 2616  2260                    482       469
 2636  2270                    488       483
 2644  2300                    494       442       453       458
    0  3000        INACTIVE    498
 2665  3005                    502       513
 2673  3010                    504       517       518
 2700  3015                    507       510
 2703  3020                    509       502       503       514       519
 2713  3030                    513       501
 2717  3040                    515       500
 2726  3050                    518       516
 2732  3060                    520       515       524
 2737  3070                    523       499
 3002  3080                    537       530
 3011  3085                    541       534
 3014  3090                    543       523
 3051  3100                    555       552
 3054  3110                    557       544
 3104  3120                    567       564
 3106  3200                    569       498       506       508       512       522       536       540       542       554
                                         556       566       568
 3117  3210                    572       582
 3133  3220                    577       571       572
 3140  3225                    580       574
 3143  3230                    582       570
 3152  4000                    588       569       576       579       581       585
 3255  4010                    621       614
 3303  4020                    630       626
 3310  4050                    632       621       629
    0  5000        INACTIVE    635
 3322  5001                    638       643       645
 3337  5005                    643       637
 3350  5010                    646       639       641       660       672       673
 3363  5020                    650       646       648       652       654       656       660       672       675
 3365  5030                    652       638
 3400  5040                    656       653
 3403  5100                    658       642       655       676
 3415  5200                    661       649       657       674
 3442  5210                    666       662       663
 3457  5220                    671       666       667       669
 3462  5230                    673       640
 3465  5240                    675       647
 3470  6000                    678       651
 3506  6010                    685       681
 3514  6020                    688       680
 3521  6030                    690       679       684       687
 3541  6040                    697       692
 3547  6050                    700       691
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          SUBROUTINE FREEZE      74/74    OPT=0 ROUND=*/ TRACE                 FTN 4.6+420          09/02/77  13.54.00          PAGE    20

 STATEMENT LABELS                        DEF LINE    REFERENCES
  3554  7000                               702         690         693         696         699
  3575  9000                               708         704         705

 LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   155  10        K           63 65         58       INSTACK
   166  20        K           67 69         58       INSTACK

 COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
        KARD          24                0 DESIGN (1)                 1 ICONFIG(1)                 2 TRAFF   (1)
                                        3 UFI    (1)                 4 TDFP    (1)                5 IPAVT   (1)
                                        6 FLEXPT (1)                 7 RIGDPT  (1)                8 AMINOR  (1)
                                        9 IFGRP  (1)                10 SMOIST  (1)               11 SUBMOD  (1)
                                       12 ISUBCBR(1)                13 ISUBHOR(1)                14 BMOIST  (1)
                                       15 DRYWT  (1)                16 CBR8    (1)               17 CHR10   (1)
                                       18 COMS   (4)                22 LCIND   (1)               23 OVR     (1)
        FLAG           1                0 IFLAG  (1)
        BLOCKB        19                0 COMPF  (1)                 1 COMPR   (1)                2 FCOMPF  (1)
                                        3 FCOMPR (1)                 4 SLSDBTF(1)                 5 SLSDBTR(1)
                                        6 SLSPENF(1)                 7 SLSPENR(1)                 8 FLSF    (1)
                                        9 FLSR   (1)                10 RSUBF   (1)               11 RSUBR   (1)
                                       12 FRSUBF (1)                13 FRSUBR  (1)               14 PRDBTF  (1)
                                       15 PRFLTF (1)                16 PRDBTR  (1)               17 PRFLTR  (1)
                                       18 XTRA   (1)
        BLOCKC        17                0 MSGSW1 (1)                 1 IIPAVT  (1)                2 MESS    (11)
                                       13 ISWITF (1)                14 ISWITR  (1)               15 MSGSW2  (1)
                                       16 MSGSW3 (1)
        BLOCKD         4                0 PVTFLX (1)                 1 PVTRGD  (1)                2 IFLEXNA(1)
                                        3 IRIGDNA(1)
        BLOCKE         1                0 ISWITX (1)

  EQUIV CLASSES    LENGTH     MEMBERS - BIAS NAME(LENGTH)
MSGSW1  MESS           11               0 MSG1   (1)                 1 MSG2    (1)                2 MSG3    (1)
                                        3 MSG4   (1)                 4 MSG5    (1)                5 MSG6    (1)
                                        6 MSG7   (1)                 7 MSG8    (1)                8 MSG9    (1)
                                        9 MSG10  (1)                10 MSG11   (1)

 STATISTICS
   PROGRAM LENGTH                     4256B    2222
   CM LABELED COMMON LENGTH            102B      66
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SUBROUTINE SUBPEN      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     1

 1                   SUBROUTINE SUBPEN (T,U,V)
                     COMMON/BLOCKC/MSGSW1,IIPAVT,MESS(11),ISWITF,ISWITR,MSGSW2,MSGSW3
                     COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
                    1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
 5                  2    ISUBHOR,BMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
                     COMMON/FLAG/ IFLAG
                  10 R = SMOIST / BMOIST
                     IF (R .LT. 2.)  GO TO 20
                     R = 2
10                20 IF (R .EQ. .6)  GO TO 70
                     IF (R .EQ. 1.)  GO TO 60
                     IF (R .EQ. 2.)  GO TO 50
                     IF (R .LT. 1.)  GO TO 40
                     S1 = T * 60./75.
15                   S2 = T * 50./75.
                     A = (R - 1.)/( 2. - 1.)
                  30 U = S1 - A * (S1 - S2)
                     GO TO 80
                  40 S1 = T * 65./75.
20                   S2 = T * 60./75.
                     A = (R - .6)/(1. - .6)
                     GO TO 30
                  50 U = T * 50./75.
                     GO TO 80
25                60 U = T * 60./75.
                     GO TO 80
                  70 U = T * 65./75.
                  80 V = U/4.
                     IF(IFLAG.EQ.2) X=U+RIGDPT
30                   IF(IFLAG.EQ.1) X=U+FLEXPT
                     IF(X.GE.72.) GO TO 90
                     IF (U .GE. 4.)  GO TO 100
                     V = 1.
                     U = 4.
35                   GO TO  100
                  90 MSGSW2 = 1
                 100 CONTINUE
                     RETURN
                     END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
    4  SUBPEN         1           38

VARIABLES       SN  TYPE             RELOCATION
  162  A            REAL                            REFS         17    DEFINED        16         21
   10  AMINOR       REAL                   KARD     REFS          3
   16  BMOIST       REAL                   KARD     REFS          3          7
   21  CBR10        REAL                   KARD     REFS          3
   20  CBR8         REAL                   KARD     REFS          3
   22  COMS         REAL          ARRAY    KARD     REFS          3
    0  DESIGN       REAL                   KARD     REFS          3
```

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        SUBROUTINE SUBPEN      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420         09/02/77  13.54.00        PAGE     2

VARIABLES       SN  TYPE              RELOCATION
    3  DFI          REAL                   KARD         REFS          3
   17  DRYWT        REAL                   KARD         REFS          3
    6  FLEXPT       REAL                   KARD         REFS          3     30
    1  ICONFIG      INTEGER                KARD         REFS          3
   11  IFGRP        INTEGER                KARD         REFS          3
    0  IFLAG        INTEGER                FLAG         REFS          6     29        30
    1  IIPAVT       INTEGER                BLOCKC       REFS          2
    5  IPAVT        INTEGER                KARD         REFS          3
   14  ISUBCBR      INTEGER                KARD         REFS          3
   15  ISUBHOR      INTEGER                KARD         REFS          3
   15  ISWITF       INTEGER                BLOCKC       REFS          2
   16  ISWITR       INTEGER                BLOCKC       REFS          2
   26  LCIND        INTEGER                KARD         REFS          3
    2  MESS         INTEGER       ARRAY    BLOCKC       REFS          2
    0  MSGSW1       INTEGER                BLOCKC       REFS          2
   17  MSGSW2       INTEGER                BLOCKC       REFS          2   DEFINED      36
   20  MSGSW3       INTEGER                BLOCKC       REFS          2
   27  OVR          REAL                   KARD         REFS          3
  157  R            REAL                                REFS          8     10        11        12        13        16        21
                                                     DEFINED          7      9
    7  RIGDPT       REAL                   KARD         REFS          3     29
   12  SMOIST       REAL                   KARD         REFS          3      7
   13  SUBMOD       REAL                   KARD         REFS          3
  160  S1           REAL                                REFS       2*17   DEFINED      14        19
  161  S2           REAL                                REFS         17   DEFINED      15        20
    0  T            REAL                   F.P.         REFS         14     15        19        20        23        25        27
                                                     DEFINED          1
    4  TOFP         REAL                   KARD         REFS          3
    2  TRAFF        REAL                   KARD         REFS          3
    0  U            REAL                   F.P.         REFS         28     29        30        32   DEFINED         1        17
                                                          23         25     27        34
    0  V            REAL                   F.P.      DEFINED          1     28        33
  163  X            REAL                                REFS         31   DEFINED      29        30

STATEMENT LABELS               DEF LINE   REFERENCES
    0  10          INACTIVE        7
   17  20                         10          8
   44  30                         17         22
   52  40                         19         13
   65  50                         23         12
   72  60                         25         11
   77  70                         27         10
  103  80                         28         18        24        26
  134  90                         36         31
  136  100                        37         32        35

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       BLOCKC       17                0 MSGSW1  (1)               1 IIPAVT  (1)                2 MESS    (11)
                                     13 ISWITF  (1)              14 ISWITH  (1)               15 MSGSW2  (1)
                                     16 MSGSW3  (1)
       KARD         24                0 DESIGN  (1)               1 ICONFIG(1)                 2 TRAFF   (1)
                                      3 DFI     (1)               4 TOFP    (1)                5 IPAVT   (1)
                                      6 FLEXPT  (1)               7 RIGDPT  (1)                8 AMINOR  (1)
                                      9 IFGRP   (1)              10 SMOIST  (1)               11 SUBMOD  (1)
                                     12 ISUBCBR(1)               13 ISUBHOR(1)                14 BMOIST  (1)
                                     15 DRYWT   (1)              16 CBR8    (1)               17 CBR10   (1)
                                     18 COMS    (4)              22 LCIND   (1)               23 OVR     (1)
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      SUBROUTINE SUHPEN      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420         09/02/77  13.54.00        PAGE     3

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
      FLAG           1                 0 IFLAG  (1)

STATISTICS
  PROGRAM LENGTH               164B     116
  CM LABELED COMMON LENGTH      52B      42
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SUBROUTINE RTN25       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00       PAGE     1

      1                 SUBROUTINE RTN25(A)
                        IA = A
                        XY = A - IA
                        IF (XY .LT. .25)  GO TO 20
      5                 A = IA + 1.
                        GO TO 30
                     20 A = IA
                     30 CONTINUE
                        RETURN
     10                 END


     SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS       DEF LINE      REFERENCES
    4  RTN25             1            9

 VARIABLES     SN  TYPE              RELOCATION
     0  A          REAL                    F.P.      REFS        2         3   DEFINED       1           5         7
    31  IA         INTEGER                           REFS        3         5         7   DEFINED       2
    32  XY         REAL                              REFS        4   DEFINED         3

 STATEMENT LABELS                   DEF LINE    REFERENCES
    23  20                               7           4
    26  30                               8           6

 STATISTICS
   PROGRAM LENGTH                      33B        27
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      SUBROUTINE PURIFY
      COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
     1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
     2    ISUBHOR,BMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
      COMMON/BLOCKA/KWITCHS(20)
      EQUIVALENCE(KWITCHS (1),KWITA),(KWITCHS(11),KWITK),
     1           (KWITCHS (2),KWITB),(KWITCHS(12),KWITL),
     2           (KWITCHS (3),KWITC),(KWITCHS(13),KWITM),
     3           (KWITCHS (4),KWITD),(KWITCHS(14),KWITN),
     4           (KWITCHS (5),KWITE),(KWITCHS(15),KWITO),
     5           (KWITCHS (6),KWITF),(KWITCHS(16),KWITP),
     6           (KWITCHS (7),KWITG),(KWITCHS(17),KWITQ),
     7           (KWITCHS (8),KWITH),(KWITCHS(18),KWITR),
     8           (KWITCHS (9),KWITI),(KWITCHS(19),KWITS),
     9           (KWITCHS(10),KWITJ),(KWITCHS(20),KWITT)
  100 IF (LCIND .EQ. 0 .AND. DESIGN .EQ. 0.) KWITA = 1
      IF (ICONFIG .LT. 1 .OR. ICONFIG .GT. 8)  KWITB = 1
      IF (TRAFF .EQ. 1HA )    GO TO 110
      IF (TRAFF .EQ. 1HB )    GO TO 110
      IF (TRAFF .EQ. 1HC )    GO TO 110
      IF (TRAFF .EQ. 1HE )    GO TO 110
      ITEST = (SHIFT(TRAFF,6).AND.77B)-33B
      IF ((ITEST .GE. 0) .AND. (ITEST .LE.9)) GO TO 110
      IF(ICONFIG.EQ.8)GO TO 110
      KWITC = 1
  110 IF (DFI.EQ.0. .AND. TDFP.EQ. 0.) KWITE=1
      IF (DFI .NE. 0. .AND. TDFP .NE. 0. )  KWITE = 1
  130 IF (IPAVT .LT. 1  .OR.  IPAVT .GT. 3)   KWITF = 1
      IF (IPAVT .EQ. 1 )    GO TO 140
      IF (IPAVT .EQ. 2 )    GO TO 150
      IF (FLEXPT .EQ. 0. ) KWITG = 1
      IF (RIGDPT .EQ. 0. ) KWITG = 1
      GO TO 160
  140 IF (FLEXPT .EQ. 0. )  KWITG = 1
      GO TO 160
  150 IF (RIGDPT .EQ. 0. )  KWITG = 1
  160 IF (AMINOR .EQ. 1HX )  GO TO 170
      IF (AMINOR .EQ. 1H  )  GO TO 170
      KWITH = 1
  170 IF (IFGRP .LT. 1 .OR. IFGRP .GT. 4 )  KWITI = 1
      IF (SMOIST .EQ. 0.)  KWITJ = 1
      IF (SUBMOD .NE. 0.) GO TO 175
      IF (IPAVT .EQ. 1)  GO TO 175
      KWITK = 1
  175 IF (ISUBHOR .LT. 1 .OR. ISUBHOR .GT. 5 )  KWITL = 1
      IF (ISUBHOR .EQ. 5 .AND. IPAVT .EQ. 1 )  KWITL = 1
      IF (BMOIST .EQ. 0.)  KWITM = 1
      IF (DRYWT .EQ. 0. )  KWITN = 1
      IF (DRYWT .LT. 100. .OR. DRYWT .GT. 150. )  KWITP = 1
      IF (IPAVT .EQ. 2 )  GO TO 180
      IF (CBR8 .EQ. 1H  .AND.  CBR10 .EQ. 1H   )  KWITQ = 1
      IF (CBR8 .EQ. 1HX .AND.  CBR10 .EQ. 1HX  )  KWITQ = 1
      IF (CBR8 .EQ. 1H  .OR.   CBR8 .EQ. 1HX  )  GO TO 180
      IF (CBR10 .EQ. 1H   .OR. CBR10 .EQ. 1HX )  GO TO 180
      KWITR = 1
  180 IF (KWITM .EQ. 1 )  GO TO 230
      IF (KWITN .EQ. 1 ) GO TO 230
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SUBROUTINE PURIFY      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     2

                    IF (KWITP .EQ. 1 )  GO TO 230
                    IF (DRYWT .NE. 100. ) GO TO 190
 60                 IF (BMOIST .LT. 5. .OR.BMOIST .GT. 20. )  KWITO = 1
                    GO TO 230
                190 IF (DRYWT .NE. 115. ) GO TO 200
                195 IF (BMOIST .LT. 5. .OR. BMOIST .GT. 15.)  KWITO = 1
                    GO TO 230
 65             200 IF (DRYWT .LT. 115. )  GO TO 195
                    IF (DRYWT .NE. 135. ) GO TO 210
                    IF (BMOIST .LT. 2. .OR. BMOIST .GT. 7. )  KWITO = 1
                    GO TO 230
                210 IF (DRYWT .GT. 135. )  GO TO 220
 70                 IF (BMOIST .LT. 5. .OR. BMOIST .GT. 7. )  KWITO = 1
                    GO TO 230
                220 IF (BMOIST .LT. 2. .OR. BMOIST .GT. 5.) KWITO = 1
                230 IF (ICONFIG .EQ. 1  .OR. ICONFIG .EQ. 2 ) GO TO 240
                    GO TO 250
 75             240 IF (TRAFF  .EQ. 1HA )   KWITS = 1
                250 IF (OVR .EQ. 1HX .OR. OVR .EQ. 1H ) GO TO 260
                255 KWITT = 1
                    GO TO 270
                260 IF (OVR .NE. 1HX) GO TO 270
 80                 IF (IPAVT .EQ. 2) GO TO 255
                    IF (FLEXPT .EQ. 0.) GO TO 255
                270 CONTINUE
                    RETURN
                    END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
   2  PURIFY         1          83

VARIABLES      SN  TYPE               RELOCATION
   10  AMINOR      REAL                   KARD        REFS        2        37      38
   16  BMOIST      REAL                   KARD        REFS        2        47      2*60     2*63     2*67     2*70     2*72
   21  CRR10       REAL                   KARD        REFS        2        51      52       2*54
   20  CRRR        REAL                   KARD        REFS        2        51      52       2*53
   22  COMS        REAL          ARRAY    KARD        REFS        2
    0  DESIGN      REAL                   KARD        REFS        2        16
    3  DFI         REAL                   KARD        REFS        2        26      27
   17  DRYWT       REAL                   KARD        REFS        2        48      2*49     59       62       65       66
                                                      69
    6  FLEXPT      REAL                   KARD        REFS        2        31      34       81
    1  ICONFIG     INTEGER                KARD        REFS        2        2*17    24       2*73
   11  IFGRP       INTEGER                KARD        REFS        2        2*40
    5  IPAVT       INTEGER                KARD        REFS        2        2*28    29       30       43       46       50
                                                      80
   14  ISUBCBR     INTEGER                KARD        REFS        2
   15  ISUBHOR     INTEGER                KARD        REFS        2        2*45    46
  363  ITEST       INTEGER                            REFS     2*23   DEFINED      22
    0  KWITA       INTEGER                BLOCKA      REFS        6   DEFINED      16
    1  KWITH       INTEGER                BLOCKA      REFS        6   DEFINED      17
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       SUBROUTINE PURIFY      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     3

  VARIABLES       SN   TYPE              RELOCATION
      2  KWITC        INTEGER                BLOCKA        REFS        6     DEFINED       25
      0  KWITCHS      INTEGER     ARRAY      BLOCKA        REFS        5        20*6
      3  KWITD        INTEGER                BLOCKA        REFS        6
      4  KWITE        INTEGER                BLOCKA        REFS        6     DEFINED       26          27
      5  KWITF        INTEGER                BLOCKA        REFS        6     DEFINED       28
      6  KWITG        INTEGER                BLOCKA        REFS        6     DEFINED       31          32          34          36
      7  KWITH        INTEGER                BLOCKA        REFS        6     DEFINED       39
     10  KWITI        INTEGER                BLOCKA        REFS        6     DEFINED       40
     11  KWITJ        INTEGER                BLOCKA        REFS        6     DEFINED       41
     12  KWITK        INTEGER                BLOCKA        REFS        6     DEFINED       44
     13  KWITL        INTEGER                BLOCKA        REFS        6     DEFINED       45          46
     14  KWITM        INTEGER                BLOCKA        REFS        6          56   DEFINED       47
     15  KWITN        INTEGER                BLOCKA        REFS        6          57   DEFINED       48
     16  KWITO        INTEGER                BLOCKA        REFS        6     DEFINED       60          63          67          70          72
     17  KWITP        INTEGER                BLOCKA        REFS        6          58   DEFINED       49
     20  KWITQ        INTEGER                BLOCKA        REFS        6     DEFINED       51          52
     21  KWITR        INTEGER                BLOCKA        REFS        6     DEFINED       55
     22  KWITS        INTEGER                BLOCKA        REFS        6     DEFINED       75
     23  KWITT        INTEGER                BLOCKA        REFS        6     DEFINED       77
     26  LCIND        INTEGER                KARD          REFS        2          16
     27  OVR          REAL                   KARD          REFS        2        2*76         79
      7  RIGDPT       REAL                   KARD          REFS        2          32         36
     12  SMOIST       REAL                   KARD          REFS        2          41
     13  SUBMOD       REAL                   KARD          REFS        2          42
      4  TDFP         REAL                   KARD          REFS        2          26         27
      2  TRAFF        REAL                   KARD          REFS        2          18         19          20          21          22          75

  INLINE FUNCTIONS     TYPE     ARGS           DEF LINE   REFERENCES
         SHIFT        NO TYPE     2   INTRIN                    22

  STATEMENT LABELS                   DEF LINE    REFERENCES
      0  100         INACTIVE           16
     46  110                            26          18         19          20          21          23          24
      0  130         INACTIVE           28
    102  140                            34          29
    106  150                            36          30
    111  160                            37          33         35
    121  170                            40          37         38
    140  175                            45          42         43
    221  180                            56          50         53          54
    243  190                            62          59
    246  195                            63          65
    255  200                            65          62
    271  210                            69          66
    302  220                            72          69
    310  230                            73          56         57          58          61          64          68          71
    316  240                            75          73
    322  250                            76          74
    330  255                            77          80         81
    333  260                            79          76
    343  270                            82          78         79

  COMMON BLOCKS     LENGTH       MEMBERS - BIAS NAME(LENGTH)
         KARD          24                0 DESIGN  (1)                1 ICONFIG(1)                 2 TRAFF   (1)
                                         3 DFI     (1)                4 TDFP    (1)                5 IPAVT   (1)
                                         6 FLEXPT  (1)                7 RIGOPT  (1)                8 AMINOR  (1)
                                         9 IFGRP   (1)               10 SMOIST  (1)               11 SUBMOD  (1)
      SUBROUTINE PURIFY      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

 COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
                                   12 ISUBCBR(1)           13 ISUBHOR(1)            14 BMOIST (1)
                                   15 DRYWT  (1)           16 CBR8    (1)           17 CBR10  (1)
                                   18 COMS   (4)           22 LCIND   (1)           23 OVR    (1)
      BLOCKA        20              0 KWITCHS(20)

 EQUIV CLASSES   LENGTH     MEMBERS - BIAS NAME(LENGTH)
KWITCHS KWITCHS     20              0 KWITA  (1)            1 KWITB  (1)             2 KWITC  (1)
                                    3 KWITD  (1)            4 KWITE  (1)             5 KWITF  (1)
                                    6 KWITG  (1)            7 KWITH  (1)             8 KWITI  (1)
                                    9 KWITJ  (1)           10 KWITK  (1)            11 KWITL  (1)
                                   12 KWITM  (1)           13 KWITN  (1)            14 KWITO  (1)
                                   15 KWITP  (1)           16 KWITQ  (1)            17 KWITR  (1)
                                   18 KWITS  (1)           19 KWITT  (1)

 STATISTICS
   PROGRAM LENGTH                  364B      244
   CM LABELED COMMON LENGTH         54B       44
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SUBROUTINE RSUBG      74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00          PAGE      1

  1                 SUBROUTINE RSUBG(RSUB,IFGRP,DI)
                    INTEGER DI
                    IF((IFGRP .LT.1) .OR. (IFGRP .GT. 3)) GO TO 400
                    GO TO (100,200,300),IFGRP
  5           C**
              C**   IFGRP = 1
              C**
               100  IF((DI .LT. 1) .OR. (DI .GT. 10)) GO TO 500
                    IF(DI .GT. 3) GO TO 110
 10                 RSUB = DINDEX (8.5,11.2,1,3,DI)
                    RETURN
               110  IF(DI .GT. 6) GO TO 120
                    RSUB = DINDEX (11.2,15.7,3,6,DI)
                    RETURN
 15            120  RSUB = DINDEX (15.7,21.3,6,10,DI)
                    RETURN
              C**
              C**   IFGRP = 2
              C**
 20            200  IF((DI .LT. 1) .OR. (DI .GT. 10)) GO TO 500
                    IF(DI .GT. 3) GO TO 210
                    RSUB = DINDEX (10.4,13.6,1,3,DI)
                    RETURN
               210  IF(DI .GT. 6) GO TO 220
 25                 RSUB = DINDEX (13.6,19.0,3,6,DI)
                    RETURN
               220  RSUB = DINDEX (19.0,26.6,6,10,DI)
                    RETURN
              C**
 30           C**   IFGRP = 3
              C**
               300  IF((DI .LT. 1) .OR. (DI .GT. 10)) GO TO 500
                    IF(DI .GT. 3) GO TO 310
                    RSUB = DINDEX (16.0,21.4,1,3,DI)
 35                 RETURN
               310  IF(DI .GT. 6) GO TO 320
                    RSUB = DINDEX (21.4,30.0,3,6,DI)
                    RETURN
               320  RSUB = DINDEX (30.0,40.9,6,10,DI)
 40                 RETURN
               400  WRITE(6,410)
                    RETURN
               500  WRITE(6,510)
               410  FORMAT(" INVALID GROUP NUMBER")
 45            510  FORMAT(" INVALID DESIGN INDEX")
                    RETURN
                    END


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

   4     I                    AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
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       SUBROUTINE RSUBG      74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     2

       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE    REFERENCES
    4  RSUBG           1        11        14        16        23        26        28        35        38        40        42
                                46

VARIABLES     SN  TYPE           RELOCATION
    0  DI        INTEGER               F.P.       REFS         2       2*8         9        10        12        13        15
                                                  2*20        21        22        24        25        27      2*32        33
                                                    34        36        37        39   DEFINED         1
    0  IFGRP     INTEGER               F.P.       REFS       2*3         4   DEFINED         1
    0  RSUB      REAL                  F.P.    DEFINED         1        10        13        15        22        25        27
                                                    34        37        39

FILE NAMES        MODE
       TAPE6    FMT                    WRITES       41        43

EXTERNALS          TYPE   ARGS       REFERENCES
       DINDEX    REAL       5             10        13        15        22        25        27        34        37        39

STATEMENT LABELS             DEF LINE   REFERENCES
   23  100                       8         4
   40  110                      12         9
   51  120                      15        12
   57  200                      20         4
   74  210                      24        21
  105  220                      27        24
  113  300                      32         4
  130  310                      36        33
  141  320                      39        36
  147  400                      41         3
  252  410     FMT              44        41
  153  500                      43         8        20        32
  256  510     FMT              45        43

STATISTICS
  PROGRAM LENGTH                302B     194
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```
         FUNCTION DINDEX     74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00       PAGE     1

      1                FUNCTION DINDEX(X1,X2,Y1,Y2,Y)
                       INTEGER Y1,Y2,Y
                       DINDEX = ALOG10(X1)+((ALOG10(X2)-ALOG10(X1))*(Y-Y1))/(Y2-Y1)
                       RETURN
      5                END


       SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    5  DINDEX          1         4

VARIABLES     SN  TYPE           RELOCATION
   37  DINDEX    REAL                           DEFINED        3
    0  X1        REAL                 F.P.        REFS        2*3   DEFINED        1
    0  X2        REAL                 F.P.        REFS         3    DEFINED        1
    0  Y         INTEGER              F.P.        REFS         2         3    DEFINED        1
    0  Y1        INTEGER              F.P.        REFS         2        2*3   DEFINED        1
    0  Y2        INTEGER              F.P.        REFS         2         3    DEFINED        1

EXTERNALS          TYPE   ARGS       REFERENCES
       ALOG10    REAL       1 LIBRARY     3*3

STATISTICS
  PROGRAM LENGTH                 40B      32
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```
   FUNCTION FLXPET     74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     1

 1                FUNCTION FLXPET(DI,CHR)
                  INTEGER DI
                  GO TO (10,20,30,30,40,40,50,60,60,70),DI
               10 FLXPET = 0.5
 5                RETURN
               20 FLXPET = 1.0
                  GO TO 80
               30 FLXPET = 1.5
                  IF(DI .EQ. 4) GO TO 80
10                RETURN
               40 FLXPET = 2.0
                  IF(DI .EQ. 5) GO TO 80
                  IF(CHR .EQ. 1HX) RETURN
                  FLXPET = 3.0
15                RETURN
               50 FLXPET = 2.5
                  GO TO 80
               60 FLXPET = 3.0
                  GO TO 80
20             70 FLXPET = 3.5
               80 IF(CHR .EQ. 1HX) RETURN
                  FLXPET = FLXPET + 0.5
                  RETURN
                  END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE     REFERENCES
   5  FLXPET          1          5         10         13         15         21         23

VARIABLES      SN   TYPE           RELOCATION
   0  CHR           REAL                F.P.        REFS       13         21     DEFINED        1
   0  DI            INTEGER             F.P.        REFS        2          3          9        12     DEFINED        1
 114  FLXPET        REAL                            REFS       22     DEFINED          4         6         8        11        14
                                                   16         18         20         22

STATEMENT LABELS                 DEF LINE   REFERENCES
   27  10                            4         3
   33  20                            6         3
   37  30                            8        2*3
   46  40                           11        2*3
   62  50                           16         3
   66  60                           18        2*3
   72  70                           20         3
   75  80                           21         7          9         12         17         19

STATISTICS
  PROGRAM LENGTH                  115B       77
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```
SUBROUTINE OUTA       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE    1

                SUBROUTINE OUTA(I)
                COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
               1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
               2    ISUBHOR,HMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
                WRITE (I,7000)
           7000 FORMAT (1H1)
                WRITE (I,7010)
           7010 FORMAT (1H0,26X,33HBASE COURSE THICKNESS REQUIRED IN)
                WRITE (I,7020)
           7020 FORMAT (1H ,25X,36HPAVEMENT DESIGN FOR FROST CONDITIONS)
                WRITE (I,7030) COMS
           7030 FORMAT (1H0,5X,4A10)
                WRITE (I,7040)
           7040 FORMAT (1H0,5X,19HINPUT PARAMETERS---)
                WRITE (I,7050)
           7050 FORMAT (1H0,10X,23HDESIGN LOADING CRITERIA)
                IF(ICONFIG .NE. 8) GO TO 198
                ITEST = (SHIFT(TRAFF,6).AND.77B)-33B
                IF (ITEST .EQ. 0) ITEST = 10
                WRITE (I,7059) ITEST
           7059 FORMAT(1H ,15X,14HDESIGN INDEX =,I3)
                GO TO 199
            198 WRITE (I,7060) TRAFF
           7060 FORMAT (1H ,15X,18HTRAFFIC AREA TYPE ,A1)
            199 WRITE (I,7070)
           7070 FORMAT (1H ,15X,28HDESIGN LOAD CONFIGURATION = )
                IF (ICONFIG .EQ. 1)  GO TO 200
                IF (ICONFIG .EQ. 2)  GO TO 210
                IF (ICONFIG .EQ. 3)  GO TO 220
                IF (ICONFIG .EQ. 4)  GO TO 230
                IF (ICONFIG .EQ. 5)  GO TO 240
                IF (ICONFIG .EQ. 6)  GO TO 250
                IF (ICONFIG .EQ. 7)  GO TO 260
                IF (ICONFIG .EQ. 8) WRITE(I,7079)
           7079 FORMAT(1H+,43X,9HROAD LOAD)
                GO TO 270
            200 WRITE (I,7080)
           7080 FORMAT (1H+,43X,37HSINGLE WHEEL-100 SQ.IN. CONTACT AREA )
                GO TO 270
            210 WRITE (I,7090)
                WRITE (I,7100)
                WRITE (I,7110)
           7090 FORMAT (1H+,43X,37HTWIN ASSEMBLY - TRICYCLE GEAR, 20 IN.)
           7100 FORMAT (1H ,43X,37HSPACING, 100 SQ.IN. CONTACT AREA      )
           7110 FORMAT (1H ,43X,10HEACH WHEEL)
                GO TO 270
            220 WRITE (I,7120)
                WRITE (I,7130)
                WRITE (I,7140)
           7120 FORMAT (1H+,43X,37HTWIN ASSEMBLY TRICYCLE GEAR, 37 IN.  )
           7130 FORMAT (1H ,43X,37HSPACING, CONTACT AREA 267 SQ.IN. EACH)
           7140 FORMAT (1H ,43X,05HWHEEL)
                GO TO 270
            230 WRITE (I,7150)
                WRITE (I,7160)
                WRITE (I,7170)
           7150 FORMAT (1H+,43X,37HSINGLE TANDEM ASSEMBLY - TRICYCLE    )
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 7160 FORMAT (1H .43X.37HGEAR. 60 IN. SPACING, CONTACT AREA    )
 7170 FORMAT (1H .43X.21H400 SQ.IN. EACH WHEEL)
      GO TO 270
  240 WRITE (I.7180)
      WRITE (I.7190)
      WRITE (I.7200)
 7180 FORMAT (1H+.43X.37HTWIN TANDEM ASSEMBLY - TRICYCLE GEAR.)
 7190 FORMAT (1H .43X.37HSPACING(IN.) 31-63. CONTACT AREA      )
 7200 FORMAT (1H .43X.21H267 SQ.IN. EACH WHEEL)
      GO TO 270
  250 WRITE (I.7210)
      WRITE (I.7220)
      WRITE (I.7230)
 7210 FORMAT (1H+.43X.37HTWIN ASSEMBLY - BICYCLE GEAR. 37 IN. )
 7220 FORMAT (1H .43X.37HSPACING, 267 SQ.IN. CONTACT AREA      )
 7230 FORMAT (1H .43X.10HEACH WHEEL)
      GO TO 270
  260 WRITE (I.7240)
      WRITE (I.7250)
      WRITE (I.7260)
 7240 FORMAT (1H+.43X.31HTWIN-TWIN ASSEMBLY BICYCLE GEAR)
 7250 FORMAT (1H .43X.35HSPACING(IN.) 37-62-37, CONTACT AREA)
 7260 FORMAT (1H .43X.21H267 SQ.IN. EACH WHEEL)
      GO TO 270
  270 WRITE (I.7270) DESIGN
 7270 FORMAT (1H .15X.14HDESIGN LOAD = .F7.0.5H LBS.)
      WRITE (I.7280)
 7280 FORMAT (1H0.10X.14HFROST CRITERIA)
      IF (DFI .FQ. 0.)  GO TO 280
      WRITE (I.7290) DFI
 7290 FORMAT (1H .15X.24HDESIGN FREEZING INDEX = .F6.0.12H DEGREE-DAYS)
  280 IF (TDFP .EQ. 0. ) GO TO 300
      WRITE (I.7300) TDFP
 7300 FORMAT (1H .15X.35HTOTAL DEPTH OF FROST PENETRATION = .F4.0.
     1    5H IN. )
  300 WRITE (I.7320)
 7320 FORMAT (1H0.10X.8HPAVEMENT)
      IF(IPAVT .EQ. 1) GO TO 310
      IF(IPAVT .EQ.2)  GO TO 320
      IF(IPAVT .EQ.3)  GO TO 330
      GO TO 340
  310 WRITE (I.7330) FLEXPT
 7330 FORMAT (1H .15X.30HFLEXIBLE PAVEMENT THICKNESS = .F3.0.4H IN.)
      IF (OVR .FQ. 1HX) WRITE (I.7335)
 7335 FORMAT (1H .15X.27HFLEXIBLE OVERRIDE IN EFFECT)
      GO TO 340
  320 WRITE (I.7340)  RIGDPT
 7340 FORMAT (1H .15X.27HRIGID PAVEMENT THICKNESS = .F3.0.4H IN.)
      GO TO 340
  330 WRITE (I.7330) FLEXPT
      IF (OVR .FQ. 1HX) WRITE (I.7335)
      WRITE (I.7340) RIGDPT
  340 IF (AMINOR .NE. 1HX)  GO TO 350
      WRITE (I.7345)
 7345 FORMAT (1H .15X.20HMINOR CLASSIFICATION)
  350 WRITE (I.7350)
 7350 FORMAT (1H0.10X.8HSUBGRADE)
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115                WRITE (I,7360) IFGRP
              7360 FORMAT (1H ,15X,15HFROST GROUP = F,I1)
                   WRITE (I,7370) SUBMOD
              7370 FORMAT (1H ,15X,14HMODULUS (K) = ,F4.0,16H LBS./SQ.IN./IN.)
                   WRITE (I,7380) SMOIST
120           7380 FORMAT (1H ,15X,19HMOISTURE CONTENT = ,F3.0,5H PCT.)
                   IF (SMOIST .LT. 99.)  GO TO 360
                   WRITE (I,7390)
              7390 FORMAT (1H ,15X,42H(ACTUAL MOISTURE CONTENT PROBABLY GREATER))
               360 WRITE (I,7400) ISUBCBR
125           7400 FORMAT (1H ,15X,13HDESIGN CBR = ,I2,5H PCT.)
                   WRITE (I,7410)
              7410 FORMAT (1H ,15X,26HHORIZONTAL VARIABILITY IS )
                   IF (ISUBHOR .EQ. 1)  GO TO 390
                   IF (ISUBHOR .EQ. 2)  GO TO 380
130                IF (ISUBHOR .EQ. 3)  GO TO 370
                   IF (ISUBHOR .EQ. 4) WRITE (I,7420)
                   IF (ISUBHOR .EQ. 5) WRITE (I,7425)
              7425 FORMAT (1H+,41X,17HSPECIAL PROVISION)
              7420 FORMAT (1H+,41X,18HEXTREMELY VARIABLE)
135                GO TO 400
               370 WRITE (I,7430)
              7430 FORMAT (1H+,41X,8HVARIABLE)
                   GO TO 400
               380 WRITE (I,7440)
140           7440 FORMAT (1H+,41X,17HSLIGHTLY VARIABLE)
                   GO TO 400
               390 WRITE (I,7450)
              7450 FORMAT (1H+,41X,7HUNIFORM)
               400 WRITE (I,7460)
145           7460 FORMAT (1H0,10X,11HBASE COURSE)
                   WRITE (I,7470) DRYWT
              7470 FORMAT (1H ,15X,18HDRY UNIT WEIGHT = ,F4.0,12H LBS./CU.FT.)
                   WRITE (I,7480) BMOIST
              7480 FORMAT (1H ,15X,19HMOISTURE CONTENT = ,F3.0,5H PCT.)
150                WRITE (I,7490)
              7490 FORMAT (1H ,15X,13HDESIGN CBR = )
                   IF (CBR8 .NE. 1HX) GO TO 410
                   WRITE (I,7500)
              7500 FORMAT (1H+,28X,7H80 PCT.)
155            410 IF (CBR10 .NE. 1HX)  GO TO 420
                   WRITE (I,7510)
              7510 FORMAT (1H+,36X,8H100 PCT.)
               420 WRITE (I,7520)
              7520 FORMAT (1H0,/,5X,18HPROGRAM RESULTS---)
160                RETURN
                   END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE      REFERENCES
   4  OUTA              1          160
```

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       SUBROUTINE OUTA         74/74  OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE      4

VARIABLES     SN  TYPE                RELOCATION
    10 AMINOR    REAL                KARD         REFS         2       110
    16 BMOIST    REAL                KARD         REFS         2       148
    21 CBR10     REAL                KARD         REFS         2       155
    20 CBRB      REAL                KARD         REFS         2       152
    22 COMS      REAL       ARRAY    KARD         REFS         2        11
     0 DESIGN    REAL                KARD         REFS         2        82
     3 DFI       REAL                KARD         REFS         2        86        87
    17 DRYWT     REAL                KARD         REFS         2       146
     6 FLEXPT    REAL                KARD         REFS         2        99       107
     0 I         INTEGER              F.P.     DEFINED         1  I/O REFS         5         7         9        11        13
                                                    15        20        23        25        34        37        40        41
                                                    42        47        48        49        54        55        56        61
                                                    62        63        68        69        70        75        76        77
                                                    82        84        87        90        93        99       101       104
                                                   107       108       109       111       113       115       117       119
                                                   122       124       126       131       132       136       139       142
                                                   144       146       148       150       153       156       158
     1 ICONFIG   INTEGER             KARD         REFS         2        17        27        28        29        30        31
                                                    32        33        34
    11 IFGRP     INTEGER             KARD         REFS         2       115
     5 IPAVT     INTEGER             KARD         REFS         2        95        96        97
    14 ISUBCRR   INTEGER             KARD         REFS         2       124
    15 ISUBHOR   INTEGER             KARD         REFS         2       128       129       130       131       132
  1313 ITEST     INTEGER                          REFS        19        20   DEFINED        18        19
    26 LCIND     INTEGER             KARD         REFS         2
    27 OVR       REAL                KARD         REFS         2       101       108
     7 RIGOPT    REAL                KARD         REFS         2       104       109
    12 SMOIST    REAL                KARD         REFS         2       119       121
    13 SUBMOD    REAL                KARD         REFS         2       117
     4 TDFP      REAL                KARD         REFS         2        89        90
     2 TRAFF     REAL                KARD         REFS         2        18        23
       VARIABLES USED AS FILE NAMES, SEE ABOVE

INLINE FUNCTIONS  TYPE    ARGS       DEF LINE  REFERENCES
       SHIFT     NO TYPE    2  INTRIN               18

STATEMENT LABELS             DEF LINE   REFERENCES
    40 198                         23        17
    43 199                         25        22
   100 200                         37        27
   104 210                         40        28
   114 220                         47        29
   124 230                         54        30
   134 240                         61        31
   144 250                         68        32
   154 260                         75        33
   163 270                         82        36        39        46        53        60        67        74        81
   174 280                         89        86
   200 300                         93        89
   215 310                         99        95
   225 320                        104        96
   231 330                        107        97
   242 340                        110        98       103       106
   247 350                        113       110
   265 360                        124       121
   314 370                        136       130
```

AD-A064 698 CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAI--ETC F/G 13/2
SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS. VOLUME III.--ETC(U)
JAN 79 E S LINDOW
UNCLASSIFIED CERL-TR-M-253-VOL-3 NL

5 OF 5
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A064698

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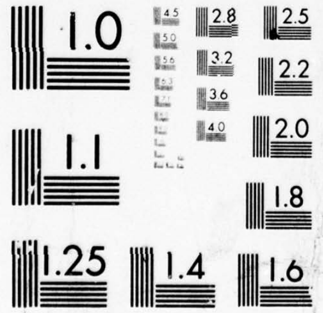

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        SUBROUTINE OUTA          74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00        PAGE     5

STATEMENT LABELS                          DEF LINE   REFERENCES
   320  380                                  139       129
   324  390                                  142       128
   327  400                                  144       135         138         141
   345  410                                  155       152
   352  420                                  158       155
   360  7000      FMT                          6         5
   365  7010      FMT                          8         7
   376  7020      FMT                         10         9
   410  7030      FMT                         12        11
   416  7040      FMT                         14        13
   425  7050      FMT                         16        15
   436  7059      FMT                         21        20
   446  7060      FMT                         24        23
   456  7070      FMT                         26        25
   466  7079      FMT                         35        34
   474  7080      FMT                         38        37
   513  7090      FMT                         43        40
   521  7100      FMT                         44        41
   527  7110      FMT                         45        42
   544  7120      FMT                         50        47
   552  7130      FMT                         51        48
   560  7140      FMT                         52        49
   574  7150      FMT                         57        54
   602  7160      FMT                         58        55
   610  7170      FMT                         59        56
   626  7180      FMT                         64        61
   634  7190      FMT                         65        62
   642  7200      FMT                         66        63
   660  7210      FMT                         71        68
   666  7220      FMT                         72        69
   674  7230      FMT                         73        70
   711  7240      FMT                         78        75
   717  7250      FMT                         79        76
   725  7260      FMT                         80        77
   736  7270      FMT                         83        82
   746  7280      FMT                         85        84
   756  7290      FMT                         88        87
   771  7300      FMT                         91        90
  1003  7320      FMT                         94        93
  1012  7330      FMT                        100        99         107
  1024  7335      FMT                        102       101         108
  1035  7340      FMT                        105       104         109
  1061  7345      FMT                        112       111
  1071  7350      FMT                        114       113
  1100  7360      FMT                        116       115
  1110  7370      FMT                        118       117
  1122  7380      FMT                        120       119
  1133  7390      FMT                        123       122
  1146  7400      FMT                        125       124
  1156  7410      FMT                        127       126
  1175  7420      FMT                        134       131
  1171  7425      FMT                        133       132
  1204  7430      FMT                        137       136
  1212  7440      FMT                        140       139
  1221  7450      FMT                        143       142
  1227  7460      FMT                        145       144
  1237  7470      FMT                        147       146
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      SUBROUTINE OUTA        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00          PAGE      6

STATEMENT LABELS                    DEF LINE    REFERENCES
 1251  7480      FMT                  149         148
 1262  7490      FMT                  151         150
 1271  7500      FMT                  154         153
 1277  7510      FMT                  157         156
 1305  7520      FMT                  159         158

COMMON BLOCKS    LENGTH       MEMBERS - BIAS NAME(LENGTH)
       KARD          24                    0 DESIGN (1)               1 ICONFIG(1)               2 TRAFF   (1)
                                           3 DFI     (1)              4 TDFP    (1)              5 IPAVT   (1)
                                           6 FLEXPT (1)               7 RIGDPT (1)               8 AMINOR (1)
                                           9 IFGRP   (1)             10 SMOIST  (1)             11 SUBMOD (1)
                                          12 ISUBCBR(1)              13 ISUBMOR(1)              14 BMOIST (1)
                                          15 DRYWT   (1)             16 CBR8 ,  (1)             17 CBR10   (1)
                                          18 COMS    (4)             22 LCIND   (1)             23 OVR     (1)

STATISTICS
  PROGRAM LENGTH                  13148       716
  CM LABELED COMMON LENGTH          308        24
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SUBROUTINE OUTB       74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00       PAGE     1

            SUBROUTINE OUTB (I)
            COMMON/BLOCKA/KWITCHS(20)
            EQUIVALENCE(KWITCHS (1),KWITA),(KWITCHS(11),KWITK),
         1             (KWITCHS (2),KWITB),(KWITCHS(12),KWITL),
         2             (KWITCHS (3),KWITC),(KWITCHS(13),KWITM),
         3             (KWITCHS (4),KWITD),(KWITCHS(14),KWITN),
         4             (KWITCHS (5),KWITE),(KWITCHS(15),KWITO),
         5             (KWITCHS (6),KWITF),(KWITCHS(16),KWITP),
         6             (KWITCHS (7),KWITG),(KWITCHS(17),KWITQ),
         7             (KWITCHS (8),KWITH),(KWITCHS(18),KWITR),
         8             (KWITCHS (9),KWITI),(KWITCHS(19),KWITS),
         9             (KWITCHS(10),KWITJ),(KWITCHS(20),KWITT)
            WRITE (I,1000)
         10 IF (KWITA .NE. 1)  GO TO 20
            WRITE (I,1010)
         20 IF (KWITH .NE. 1)  GO TO 30
            WRITE (I,1020)
         30 IF (KWITC .NE. 1)  GO TO 50
            WRITE (I,1030)
         50 IF (KWITE .NE. 1)  GO TO 60
            WRITE (I,1050)
         60 IF (KWITF .NE. 1)  GO TO 70
            WRITE (I,1060)
         70 IF (KWITG .NE. 1)  GO TO 80
            WRITE (I,1070)
         80 IF (KWITH .NE. 1)  GO TO 90
            WRITE (I,1080)
         90 IF (KWITI .NE. 1)  GO TO 100
            WRITE (I,1090)
        100 IF (KWITJ .NE. 1)  GO TO  110
            WRITE (I,1100)
        110 IF (KWITK .NE. 1)  GO TO 120
            WRITE (I,1110)
        120 IF (KWITL .NE. 1)  GO TO 130
            WRITE (I,1120)
        130 IF (KWITM .NE. 1)  GO TO 140
            WRITE (I,1130)
        140 IF (KWITN .NE. 1)  GO TO 150
            WRITE (I,1140)
        150 IF (KWITO .NE. 1)  GO TO 160
            WRITE (I,1150)
        160 IF (KWITP .NE. 1)  GO TO 170
            WRITE (I,1160)
        170 IF (KWITQ .NE. 1)  GO TO 180
            WRITE (I,1170)
        180 IF (KWITR .NE. 1)  GO TO 190
            WRITE (I,1180)
        190 IF (KWITS .NE. 1)  GO TO 200
            WRITE (I,1190)
        200 IF (KWITT .NE. 1)  GO TO 9000
            WRITE (I,1200)
            GO TO 9000
       1000 FORMAT (1H0,40HANALYSIS TERMINATED BECAUSE OF FOLLOWING,
         1         15H INPUT ERRORS--,/)
       1010 FORMAT (1H ,5X,19HMISSING DESIGN LOAD)
       1020 FORMAT (1H ,5X,26HINVALID CONFIGURATION CODE)
       1030 FORMAT(1H ,5X,49HINVALID TRAFFIC AREA CODE OR INVALID DESIGN INDEX
SUBROUTINE OUTB        74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00          PAGE     2

           1)
      1050 FORMAT (1H ,5X,33HINCOMPATABLE FROST CRITERIA GIVEN)
      1060 FORMAT (1H ,5X,26HINVALID PAVEMENT TYPE CODE)
      1070 FORMAT (1H ,5X,26HMISSING PAVEMENT THICKNESS)
      1080 FORMAT (1H ,5X,18HINVALID MINOR CODE)
      1090 FORMAT (1H ,5X,19HINVALID FROST GROUP)
      1100 FORMAT (1H ,5X,25HSUBGRADE MOISTURE MISSING)
      1110 FORMAT (1H ,5X,24HSUBGRADE MODULUS MISSING)
      1120 FORMAT (1H ,5X,22HINVALID HOR. VAR. CODE)
      1130 FORMAT (1H ,5X,29HMISSING BASE MOISTURE CONTENT)
      1140 FORMAT (1H ,5X,28HMISSING BASE DRY UNIT WEIGHT)
      1150 FORMAT (1H ,5X,40HBASE MOISTURE/DRY WEIGHT INCOMPATABILITY)
      1160 FORMAT (1H ,5X,18HINVALID DRY WEIGHT)
      1170 FORMAT (1H ,5X,24HBASE CBR INCOMPATABILITY)
      1180 FORMAT (1H ,5X,11HINVALID CBR)
      1190 FORMAT (1H ,5X,44HINCOMPATABLE CONFIGURATION CODE/TRAFFIC AREA)
      1200 FORMAT (1H ,5X,25HINVALID FLEXIBLE OVERRIDE)
      9000 CONTINUE
           RETURN
           END


SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  OUTB             1          76

VARIABLES        SN  TYPE               RELOCATION
    0  I             INTEGER                 F.P.       DEFINED       1     I/O REFS      13          15          17          19          21
                                                             23      25          27      29          31          33          35          37
                                                             39      41          43      45          47          49          51
    0  KWITA         INTEGER                BLOCKA       REFS         3          14
    1  KWITB         INTEGER                BLOCKA       REFS         3          16
    2  KWITC         INTEGER                BLOCKA       REFS         3          18
    0  KWITCHS       INTEGER     ARRAY      BLOCKA       REFS         2          20*3
    3  KWITD         INTEGER                BLOCKA       REFS         3
    4  KWITE         INTEGER                BLOCKA       REFS         3          20
    5  KWITF         INTEGER                BLOCKA       REFS         3          22
    6  KWITG         INTEGER                BLOCKA       REFS         3          24
    7  KWITH         INTEGER                BLOCKA       REFS         3          26
   10  KWITI         INTEGER                BLOCKA       REFS         3          28
   11  KWITJ         INTEGER                BLOCKA       REFS         3          30
   12  KWITK         INTEGER                BLOCKA       REFS         3          32
   13  KWITL         INTEGER                BLOCKA       REFS         3          34
   14  KWITM         INTEGER                BLOCKA       REFS         3          36
   15  KWITN         INTEGER                BLOCKA       REFS         3          38
   16  KWITO         INTEGER                BLOCKA       REFS         3          40
   17  KWITP         INTEGER                BLOCKA       REFS         3          42
   20  KWITQ         INTEGER                BLOCKA       REFS         3          44
   21  KWITR         INTEGER                BLOCKA       REFS         3          46
   22  KWITS         INTEGER                BLOCKA       REFS         3          48
   23  KWITT         INTEGER                BLOCKA       REFS         3          50
       VARIABLES USED AS FILE NAMES, SEE ABOVE
       SUBROUTINE OUTR       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE      3

STATEMENT LABELS                DEF LINE   REFERENCES
    0  10          INACTIVE        14
   16  20                          16          14
   23  30                          18          16
   30  50                          20          18
   35  60                          22          20
   42  70                          24          22
   47  80                          26          24
   54  90                          28          26
   61  100                         30          28
   66  110                         32          30
   73  120                         34          32
  100  130                         36          34
  105  140                         38          36
  112  150                         40          38
  117  160                         42          40
  124  170                         44          42
  131  180                         46          44
  135  190                         48          46
  143  200                         50          48
  245  1000    FMT                 53          13
  256  1010    FMT                 55          15
  262  1020    FMT                 56          17
  267  1030    FMT                 57          19
  276  1050    FMT                 59          21
  304  1060    FMT                 60          23
  311  1070    FMT                 61          25
  316  1080    FMT                 62          27
  322  1090    FMT                 63          29
  326  1100    FMT                 64          31
  333  1110    FMT                 65          33
  340  1120    FMT                 66          35
  345  1130    FMT                 67          37
  352  1140    FMT                 68          39
  357  1150    FMT                 69          41
  365  1160    FMT                 70          43
  371  1170    FMT                 71          45
  376  1180    FMT                 72          47
  402  1190    FMT                 73          49
  411  1200    FMT                 74          51
  151  9000                        75          50        52

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       BLOCKA       20                 0 KWITCHS(20)  .

EQUIV CLASSES    LENGTH      MEMBERS - BIAS NAME(LENGTH)
KWITCHS KWITCHS     20                 0 KWITA   (1)                  1 KWITB   (1)                  2 KWITC   (1)
                                       3 KWITD   (1)                  4 KWITE   (1)                  5 KWITF   (1)
                                       6 KWITG   (1)                  7 KWITH   (1)                  8 KWITI   (1)
                                       9 KWITJ   (1)                 10 KWITK   (1)                 11 KWITL   (1)
                                      12 KWITM   (1)                 13 KWITN   (1)                 14 KWITO   (1)
                                      15 KWITP   (1)                 16 KWITQ   (1)                 17 KWITR   (1)
                                      18 KWITS   (1)                 19 KWITT   (1)

STATISTICS
  PROGRAM LENGTH                   416B      2[illegible]
  CM LABELED COMMON LENGTH          24B      20
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```
      SUBROUTINE OUTC(I)
      COMMON/ABLK3/AKEFT(10),IFSWIT(10)
      COMMON/BLOCKB/COMPF,COMPR,FCOMPF,FCOMPR,SLSDBTF,
     1    SLSDBTR,SLSPENF,SLSPENR,FLSF,FLSR,RSUBF,RSUBR,
     2    FRSUBF,FRSUBR,PRDBTF,PRFLTF,PRDBTR,PRFLTR,XTRA
      COMMON/BLOCKC/MSGSW1,IIPAVT,MESS(11),ISWITF,ISWITR,MSGSW2,MSGSW3
      COMMON/BLOCKD/PVTFLX,PVTRGD,IFLEXNA,IRIGDNA
      COMMON/BLOCKE/ ISWITX
      COMMON /BSBLK/ IRTE,FDE
      COMMON/BSBLK2/FDEF
      COMMON/KARD/DESIGN,ICONFIG,TRAFF,DFI,TDFP,IPAVT,
     1    FLEXPT,RIGDPT,AMINOR,IFGRP,SMOIST,SUBMOD,ISUBCBR,
     2    ISUBHOR,HMOIST,DRYWT,CBR8,CBR10,COMS(4) ,LCIND,OVR
      EQUIVALENCE (MESS(1),MSG1),(MESS(2),MSG2),
     1            (MESS(3),MSG3),(MESS(4),MSG4),
     2            (MESS(5),MSG5),(MESS(6),MSG6),
     3            (MESS(7),MSG7),(MESS(8),MSG8),
     4            (MESS(9),MSG9),(MESS(10),MSG10),
     5            (MESS(11),MSG11)
      IA = 40
      IB = 60
      IC = 75
      I=9
*     MESSAGE SECTION
 5000 MSG6 = 1
      MSG7 = 1
      IF((MSG10.EQ.1).O.(MSG11.EQ.1)) GO TO 5005
 5001 IF (ISWITR .EQ. ISWITF) GO TO 5030
      IF (ISWITR .EQ. 0  .OR.  ISWITR .EQ. 1)  GO TO 5010
      IF (ISWITR .EQ. 2)  GO TO 5230
      ASSIGN 5010 TO MSG01
      GO TO 5100
 5005 IF((IFGRP.EQ.4).O.(ISUBHOR.NE.5)) GO TO 5001
      ISWITR = 4
      GO TO 5001
 5010 IF (ISWITF .EQ. 0 .OR. ISWITF .EQ. 1)   GO TO 5020
      IF (ISWITF .EQ. 3)  GO TO 5240
      ASSIGN  5020 TO MSG02
      GO TO 5200
 5020 CONTINUE
      GO TO 6000
 5030 IF (ISWITR .EQ. 0 .OR.  ISWITR .EQ. 1)  GO TO 5020
      IF (ISWITR .EQ. 2)  GO TO 5040
      ASSIGN 5020  TO MSG01
      GO TO 5100
 5040 ASSIGN 5020  TO MSG02
      GO TO 5200
 5100 IF (IFGRP .LT. 4)  MSG1 = 1
      IF (TRAFF .EQ. 1HE)  MSG3 = 1
      GO TO MSG01 (5010,5020)
 5200 IF (MSGSW2 .EQ. 1 .AND. IPAVT .EQ. 2)  MSG2 = 1
      IF (TRAFF .NE. 1HE)  GO TO 5210
      IF (ISWITX .EQ. 1) GO TO 5210
      IF (IFGRP .EQ. 3)  MSG4 = 1
      IF (IFGRP .EQ. 2 .OR. IFGRP .EQ. 1)  MSG5 = 1
 5210 IF (IFGRP .LT. 3)  GO TO 5220
      IF (ISUBHOR .EQ. 1)  GO TO 5220
      MSG9 = 1
      IF (ISUBHOR .NE. 4)  GO TO 5220
      MSG9 = 1
 5220 CONTINUE
      GO TO MSG02 (5010,5020)
 5230 ASSIGN  5010  TO MSG02
      GO TO 5200
 5240 ASSIGN  5020  TO MSG01
      GO TO 5100
*    END MESSAGE SECTION
6000  CONTINUE
      MSGSW1 = 1
      IF (IIPAVT .EQ. 1)  GO TO 300
      IF (IIPAVT .EQ. 2)  GO TO 400
*    BOTH FLEXIBLE AND RIDGID PAVEMENT RESULTS
      WRITE(I,8001)
      WRITE(I,8002)
      WRITE(I,8003)
 8001 FORMAT("1"///40X,32H********************************)
 8002 FORMAT       (40X,32H*    FROST ANALYSIS RESULTS    *)
 8003 FORMAT       (40X,32H********************************//)
      WRITE (I,8010)
      WRITE (I,8020)
      IF (ISWITF .EQ. 1)  GO TO 210
      IF (ISWITF .EQ. 2)  GO TO 200
      IF (ISWITF .EQ. 3) WRITE (I,8030)
      GO TO 220
  200 WRITE (I,8040)
      GO TO 220
  210 WRITE (I,8050)
  220 WRITE (I,8052)
      WRITE (I,8020)
      IF (ISWITR .EQ. 1)  WRITE (I,8050)
      IF (ISWITR .EQ. 2)  WRITE (I,8040)
      IF (ISWITR .EQ. 3)  WRITE (I,8030)
      IF (ISWITR .EQ. 4) WRITE (I,8035)
 8000 FORMAT (1H ,62X,15HFLEXIBLE  RIGID)
 8010 FORMAT (1H ,10X,9HFLEXIBLE )
 8020 FORMAT (1H+,19X,28HCONTROLLING DESIGN METHOD = )
 8030 FORMAT (1H+,47X,25HREDUCED SUBGRADE STRENGTH)
 8035 FORMAT (1H+,47X,38HUNDETERMINED (RSS DESIGN NOT RESOLVED))
 8040 FORMAT (1H+,47X,34HLIMITED SUBGRADE FROST PENETRATION)
 8050 FORMAT (1H+,47X,19HCOMPLETE PROTECTION)
 8052 FORMAT (1H ,10X,6HRIGID )
 8060 FORMAT (1H0,/,/)
 8070 FORMAT (1H0,15X,45H*********************************************)
 8080 FORMAT (1H ,15X,45H* APPROVAL NEEDED FOR USE OF THIS THICKNESS *)
 8090 FORMAT (1H ,15X,45H*********************************************)
  240 WRITE (I,8000)
      WRITE (I,8100)
 8100 FORMAT (1H0,10X,29HMETHOD OF COMPLETE PROTECTION)
      IF (IFLEXNA .EQ. 1) GO TO 250
      WRITE (I,8220)
  250 IF (IRIGDNA .EQ. 1) GO TO 255
      WRITE (I,8210)
  255 IF (MSGSW1 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
 8110 FORMAT (1H ,15X,27HDESIGN BASE THICKNESS (IN.))
      WRITE (I,8120) COMPF,COMPR
      WRITE (I,8125)
 8125 FORMAT (1H ,15X,24HPAVEMENT THICKNESS (IN.))
      WRITE (I,8120) PVTFLX,PVTRGD
 8120 FORMAT(1H+,64X,F5.1,2X,F5.1)
      WRITE (I,8130)
 8130 FORMAT (1H ,15X,22HFILTER THICKNESS (IN.))
      WRITE (I,8120) FCOMPF,FCOMPR
      A = COMPF + PVTFLX + FCOMPF
      B = COMPR + PVTRGD + FCOMPR
      IF(ISWITF.EQ.1)  FDEF=A
      IF(ISWITR.EQ.1)  FDE=B
      WRITE (I,8135)
 8135 FORMAT (1H ,15X,21HTOTAL THICKNESS (IN.))
      WRITE (I,8120) A,B
      WRITE (I,8140)
 8140 FORMAT (1H0,10X,44HMETHOD OF LIMITED SUBGRADE FROST PENETRATION)
      IF (IFLEXNA .EQ. 2 .OR. IFLEXNA .EQ. 6) GO TO 260
      WRITE (I,8220)
  260 IF (IRIGDNA .EQ. 2 .OR. IRIGDNA .EQ. 6)  GO TO 265
      WRITE (I,8210)
  265 IF (MSGSW2 .EQ. 1)  WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8120) SLSDHTF,SLSDBTR
      WRITE (I,8125)
      WRITE (I,8120) PVTFLX,PVTRGD
      WRITE (I,8130)
      WRITE (I,8120) FLSF,FLSR
      A = SLSDBTF + PVTFLX + FLSF
      B = SLSDBTR + PVTRGD + FLSR
      IF(ISWITF.EQ.2)  FDEF=A
      IF(ISWITR.EQ.2)  FDE=B
      WRITE (I,8135)
      WRITE (I,8120) A,B
      WRITE (I,8150)
 8150 FORMAT (1H ,15X,27HRESULTANT FROST PENETRATION,
     1    20H INTO SUBGRADE (IN.))
      WRITE (I,8160) SLSPENF,SLSPENR
 8160 FORMAT (1H+,65X,F4.1,3X,F4.1)
      WRITE (I,8170)
 8170 FORMAT (1H0,10X,35HMETHOD OF REDUCED SUBGRADE STRENGTH)
      IF (IFLEXNA .EQ. 4 .OR. IFLEXNA .EQ. 6) GO TO 270
      WRITE (I,8220)
  270 IF (IRIGDNA .EQ. 6) GO TO 275
      WRITE (I,8210)
  275 IF (MSGSW3 .EQ. 1)  WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8120) RSUBF,RSUBR
      WRITE (I,8125)
      IF (MSG11 .NE. 1) GO TO 280
      WRITE (I,8200) PVTFLX
 8200 FORMAT (1H+,64X,F5.1,2X,14HSEE NOTE BELOW )
      GO TO 290
  280 WRITE (I,8120) PVTFLX,PVTRGD
  290 WRITE (I,8130)
      WRITE (I,8120) FRSUBF,FRSUBR
      A = RSUBF + PVTFLX + FRSUBF
      B = RSUBR + PVTRGD + FRSUBR
      IF(ISWITF.EQ.3)  FDEF=A
      IF(ISWITR.EQ.3)  FDE=B
      IF(MSG11.EQ.1) GO TO 281
      WRITE (I,8135)
      WRITE (I,8120) A,B
  281 CONTINUE
      GO TO 500
*    FLEXIBLE PAVEMENT RESULTS ONLY
  300 WRITE (I,8010)
      WRITE (I,8020)
      IF (ISWITF .EQ. 1)  GO TO 320
      IF (ISWITF .EQ. 2)  GO TO 310
      IF (ISWITF .EQ. 3) WRITE (I,8030)
      GO TO 330
  310 WRITE (I,8040)
  320 WRITE (I,8050)
      GO TO 330
  330 CONTINUE
  350 WRITE (I,8300)
 8300 FORMAT (1H ,62X,8HFLEXIBLE)
      WRITE (I,8100)
      IF (IFLEXNA .EQ. 1) GO TO 360
      WRITE (I,8220)
  360 IF (MSGSW1 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8310) COMPF
      WRITE (I,8125)
      WRITE (I,8310) PVTFLX
 8310 FORMAT (1H+,64X,F5.1)
      WRITE (I,8130)
      WRITE (I,8310)  FCOMPF
      A = COMPF + PVTFLX + FCOMPF
      IF(ISWITF.EQ.1)  FDEF=A
      WRITE (I,8135)
      WRITE (I,8310) A
      WRITE (I,8140)
      IF (IFLEXNA .EQ. 2 .OR. IFLEXNA .EQ. 6) GO TO 370
      WRITE (I,8220)
  370 IF (MSGSW2 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8310) SLSDBTF
      WRITE (I,8125)
      WRITE (I,8310) PVTFLX
      WRITE (I,8130)
      WRITE (I,8310) FLSF
      A = SLSDBTF + PVTFLX + FLSF
      IF(ISWITF.EQ.2)  FDEF=A
      WRITE (I,8135)
      WRITE (I,8310)  A
      WRITE (I,8150)
      WRITE (I,8320) SLSPENF
 8320 FORMAT (1H+,65X,F4.1)
      WRITE (I,8170)
      IF (IFLEXNA .EQ. 4 .OR. IFLEXNA .EQ. 6) GO TO 380
      WRITE (I,8220)
  380 IF (MSGSW3 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8310) RSUBF
      WRITE (I,8125)
      WRITE (I,8310) PVTFLX
      WRITE (I,8130)
      WRITE (I,8310) FRSUBF
      A = RSUBF + PVTFLX + FRSUBF
      IF(ISWITF.EQ.3)  FDEF=A
      WRITE (I,8135)
      WRITE (I,8310) A
      GO TO 500
*     RIGID PAVEMENT RESULTS ONLY.
  400 WRITE (I,8052)
      WRITE (I,8020)
      IF (ISWITR .EQ. 1)  GO TO 420
      IF (ISWITR .EQ. 2)  GO TO 410
      IF (ISWITR .EQ. 3) WRITE (I,8030)
      IF (ISWITR .EQ. 4) WRITE (I,8035)
      GO TO 430
  410 WRITE (I,8040)
      GO TO 430
  420 WRITE (I,8050)
  430 CONTINUE
  450 WRITE (I,8400)
 8400 FORMAT (1H ,72X,5HRIGID)
      WRITE (I,8100)
      IF (IRIGDNA .EQ. 1) GO TO 452
      WRITE (I,8210)
  452 IF (MSGSW1 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8410) COMPR
      WRITE (I,8125)
      WRITE (I,8410) PVTRGD
 8410 FORMAT (1H+,71X,F5.1)
      WRITE (I,8130)
      WRITE (I,8410) FCOMPR
      B = COMPR + PVTRGD + FCOMPR
      IF(ISWITR.EQ.1)  FDE=B
      WRITE (I,8135)
      WRITE (I,8410) B
      WRITE (I,8140)
      IF (IRIGDNA .EQ. 2 .OR. IRIGDNA .EQ. 6) GO TO 457
      WRITE (I,8210)
  457 IF (MSGSW2 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8410) SLSDBTR
      WRITE (I,8125)
      WRITE (I,8410) PVTRGD
      WRITE (I,8130)
      WRITE (I,8410) FLSR
      B = SLSDBTR + PVTRGD + FLSR
      IF(ISWITR.EQ.2)  FDE=B
      WRITE (I,8135)
      WRITE (I,8410) B
      WRITE (I,8150)
      WRITE (I,8420) SLSPENR
 8420 FORMAT (1H+,72X,F4.1)
      WRITE (I,8170)
      IF (IRIGDNA .EQ. 6) GO TO 462
      WRITE (I,8210)
  462 IF (MSGSW3 .EQ. 1) WRITE (I,8080)
      WRITE (I,8110)
      WRITE (I,8410) RSUBR
      WRITE (I,8125)
      IF (MSG11 .NE. 1) GO TO 470
      WRITE (I,8450)
 8450 FORMAT (1H+,71X,14HSEE NOTE BELOW )
      GO TO 480
  470 WRITE (I,8410) PVTRGD
  480 WRITE (I,8130)
      WRITE (I,8410) FRSUBR
      B = RSUBR + PVTRGD + FRSUBR
      IF(ISWITR.EQ.3)  FDE=B
      IF(MSG11.EQ.1) GO TO 282
      WRITE (I,8135)
      WRITE (I,8410) B
 282  CONTINUE
      GO TO 500
 8210 FORMAT (1H+,73X,2HNA )
 8220 FORMAT (1H+,66X,2HNA )
 8230 FORMAT (1H0,2X,42HNA - DENOTES THAT VALUES FOR THE PAVEMENT ,
     1     34HAND METHOD INDICATED DO NOT APPLY. )
 8240 FORMAT (/10X,"THE ABOVE STRUCTURAL DESIGN IS A TYPICAL SECTION FOR
     1 ILLUSTRATIVE PURPOSES ONLY.  THE ACTUAL STRUCTURAL LAYERS AND THI
     2CKNESSESS DEPEND ON THE DESIGN INPUT.")
*     CHECK MESSAGE SWITCHES
  500 WRITE (I,8230)
      WRITE (I,8240)
      WRITE (I,8500)
 8500 FORMAT (1H1)
      IF (MSG1 .NE. 1)  GO TO 510
      WRITE (I,8510)
      WRITE (I,8511)
      WRITE (I,8512)
      WRITE (I,8513)
      WRITE (I,8514)
  510 IF (MSG2 .NE. 1)  GO TO 520
      WRITE (I,8520)
      WRITE (I,8521)
      WRITE (I,8522)
      WRITE (I,8523)
      WRITE (I,8524)
      WRITE (I,8525)
  520 IF (MSG3 .NE. 1)  GO TO 530
      WRITE (I,8530) IC
      WRITE (I,8531)
      WRITE (I,8532)
  530 IF (MSG4 .NE. 1)  GO TO 540
      WRITE (I,8530) IB
      WRITE (I,8531)
      WRITE (I,8532)
  540 IF (MSG5 .NE. 1)  GO TO 550
      WRITE (I,8530) IA
      WRITE (I,8531)
      WRITE (I,8532)
  550 IF (MSG6 .NE. 1)  GO TO 560
      WRITE (I,8540)
      WRITE (I,8541)
      WRITE (I,8542)
      WRITE (I,8620)
      WRITE (I,8621)
  560 IF (MSG7 .NE. 1)  GO TO 570
      WRITE (I,8550)
      WRITE (I,8551)
      WRITE (I,8552)
  570 IF (MSG8 .NE. 1)  GO TO 580
      WRITE (I,8560)
      WRITE (I,8561)
      WRITE (I,8562)
  580 IF (MSG9 .NE. 1)  GO TO 600
      WRITE (I,8570)
      WRITE (I,8571)
  600 IF (XTRA .NE. 1.)  GO TO 700
      WRITE (I,8070)
      WRITE (I,8580)
      WRITE (I,8581)
      WRITE (I,8582)
      WRITE (I,8090)
  700 IF (MSG10 .NE. 1)  GO TO 800
      WRITE (I,8650)
  800 IF (MSG11 .NE. 1)  GO TO 900
      WRITE (I,8640)
  900 IF (ISWITR .NE. 3 .AND. ISWITF .NE. 3)  GO TO 1000
      WRITE (I,8630)
      WRITE (I,8631)
      WRITE (I,8632)
      WRITE (I,8633)
      WRITE (I,8634)
 8580 FORMAT (1H ,15X,45H*    FLEXIBLE PAVEMENT DESIGN THICKNESS      *)
 8581 FORMAT (1H ,15X,45H*     IS GREATER THAN THAT DESIRED FOR      *)
 8582 FORMAT (1H ,15X,45H*                FROST PENETRATION          *)
 8510 FORMAT (1H0,10X,44HPREFERRED DESIGN INDICATED MAY BE USED ONLY ,
     1     20HIF NON-UNIFORM HEAVE)
 8511 FORMAT (1H ,10X,44HIS WITHIN ACCEPTABLE LIMITS, OR CAN BE MADE ,
     1     18HACCEPTABLE BY (1) )
 8512 FORMAT (1H ,10X,44HREMOVING ISOLATED POCKETS OF UNSATISFACTORY ,
     1     17H MATERIAL TO FULL)
 8513 FORMAT (1H ,10X,44HDEPTH OF FROST PENETRATION, OR BY (2) PROVID,
     1     11HING GRADUAL)
 8514 FORMAT (1H ,10X,44HTRANSITIONS AT ABRUPT CHANGES IN SUBGRADE   ,
     1     11HCONDITIONS.)
 8520 FORMAT (1H0,10X,44HCONSIDERATION SHOULD BE GIVEN TO THE FOLLOWI,
     1     18HNG ALTERNATIVES TO)
 8521 FORMAT (1H ,10X,44HLIMIT COMBINED THICKNESS OF PAVEMENT AND BAS,
     1     16HE TO 72 INCHES--)
 8522 FORMAT (1H ,12X,28H1. USE OF REINFORCING STEEL.)
 8523 FORMAT (1H ,12X,42H2. POURING OF CONCRETE IN 15 SQ.FT. SLABS.)
 8524 FORMAT (1H ,12X,43H3. USE OF A HIGH MOISTURE RETENTION UNIFORM)
 8525 FORMAT (1H ,12X,31H   FINE SAND FOR BASE MATERIAL.)
 8530 FORMAT (1H0,10X,27HPREFFERED DESIGN REPRESENTS,1X,I2,1X,
     1    29HPERCENT OF COMBINED THICKNESS)
8531 FORMAT (1H ,10X,45HOF PAVEMENT AND BASE IN A TYPE B TRAFFIC AREA,
     1    13H. JUDGMENT IS)
8532 FORMAT (1H ,10X,46HREQUIRED TO VERIFY VALIDITY OF THIS REDUCTION.)
8540 FORMAT (1H0,10X,44HPREFERRED DESIGN INDICATED IS BASED STRICTLY,
     1    24H ON FROST CONSIDERATIONS)
8541 FORMAT (1H ,10X,44HAND SHOULD BE CONSIDERED CONTROLLING ONLY IF,
     1    22H IT ADDITIONALLY MEETS)
8542 FORMAT (1H ,10X,46HTHE DESIGN CRITERIA APPLICABLE TO OTHER DESIGN,
     1    16H CONSIDERATIONS.)
8550 FORMAT (1H0,10X,39HPREFERRED DESIGN IS BASED ON AUTOMATED ,
     1              27HDECISIONS WHICH HAVE LITTLE)
8551 FORMAT (1H ,10X,39HOR NO CAPACITY TO EXERCISE ENGINEERING ,
     1              32HJUDGEMENT. IT SHOULD BE EXAMINED)
8552 FORMAT (1H ,10X,41HCRITICALLY WITH RESPECT TO FURTHER NOTES ,
     1              23HAPPEARING IN THIS LIST.)
8560 FORMAT (1H0,10X,45HENGINEERING JUDGEMENT SHOULD BE EXERCISED TO ,
     1              25HINSURE THAT THE PREFERRED)
8561 FORMAT (1H ,10X,41HDESIGN INDICATED WILL PROVIDE ACCEPTABLE ,
     1              21HHORIZONTAL UNIFORMITY)
8562 FORMAT (1H ,10X,22HIN THE SUBGRADE SOILS.)
8570 FORMAT (1H0,10X,46HCONSIDERATION MAY BE GIVEN TO DESIGN BY METHOD,
     1              24H OF COMPLETE PROTECTION.)
8571 FORMAT (1H ,10X,45HAPPROVAL OF CHIEF OF ENGINEERS IS REQUIRED TO,
     1              17H USE THIS METHOD.)
8610 FORMAT (1H0,10X,42HSEE USER MANUAL FOR MESSAGES DEALING WITH ,
     1    24HNON-CONTROLLING METHODS.)
8620 FORMAT (1H0,10X,44HTHE BASE COURSE DRAINAGE CRITERIA OF EM 1110,
     1    21H-345-282 COMMONLY MAY)
8621 FORMAT (1H ,10X,44HREQUIRE USE OF BASE COURSE THICKNESS GREATER,
     1    27H THAN THOSE OUTLINED ABOVE.)
8630 FORMAT (1H0,10X,44HNOTE THAT THE REDUCED SUBGRADE STRENGTH DESI,
     1    14HGN CAN BE USED)
8631 FORMAT (1H ,10X,44HONLY IF LOCAL EXPERIENCE AND RECORDS AND STU,
     1    13HDY OF THE SPECIFIC)
8632 FORMAT (1H ,10X,43HSUBGRADE CONDITIONS INDICATE THAT OBJECTION,
     1    17HABLE DIFFERENTIAL)
8633 FORMAT (1H ,10X,40HHEAVE AND CRACKING OF PAVEMENTS WILL NOT,
     1     7H OCCUR.)
8634 FORMAT (1H ,10X,41HNOTE FURTHER THAT CONSIDERATION OF LOCAL ,
     1    22HEXPERIENCE AND RECORDS,/,11X,23HMUST TAKE INTO ACCOUNT ,
     2    35HTHE SEVERITY OF FREEZING CONDITIONS,/,11X,
     3    50HACTUALLY EXPERIENCED DURING THE PERIOD OF RECORD. ,
     4    10HFREQUENTLY,/,11X,35HTHESE CONDITIONS MAY BE WELL BELOW ,
     5    33HTHE DESIGN FREEZING INDEX LEVEL. )
8640 FORMAT (1H0,10X,41HPAVEMENT THICKNESS IS OBTAINED FROM RIGID,
     1    19H STRUCTURAL DESIGN,/,11X,25HMANUAL (TM5-824-3) USING ,
     2    32HA K VALUE OF 50 FOR F1,35 FOR F2 ,
     3    /,11X,13HOR 25 FOR F3.)
8650 FORMAT (1H0,10X,42HTHICKNESS OF BASE PLUS FILTER IS LESS THAN,
     1    19H THICKNESS OF RIGID,/,11X,22HPAVEMENT CONTRARY TO D,
     2    36HESIGN MANUAL.ENTER REVISED VALUES OF,/,11X,
     3    56HSUBGRADE MODULUS AND RIGID PAVEMENT THICKNESS TO IMPROVE,
     4    /,11X,16HTHIS COMPARISON.)
1000 CONTINUE
     WRITE (1,8610)
     RETURN
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      SUBROUTINE OUTC        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE     9

                     END


 CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

     312     I       45CD 314  TOTAL RECORD LENGTH IS GREATER THAN 137 CHARACTERS.  IT MAY EXCEED THE I/O DEVICE CAPACITY.


      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     4  OUTC             1        456

 VARIABLES       SN  TYPE              RELOCATION
  3670  A            REAL                             REFS       126       130       146       149       174       178       206
                                                       208       220       222       237       239   DEFINED       124       144
                                                       172       205       219       236
     0  AKEFT        REAL       ARRAY     ABLK3       REFS         2
    10  AMINOR       REAL                 KARD        REFS        11
  3671  B            REAL                             REFS       127       130       147       149       175       178       267
                                                       269       281       283       302       305   DEFINED       125       145
                                                       173       266       280       301
    16  BMOIST       REAL                 KARD        REFS        11
    21  CSP10        REAL                 KARD        REFS        11
    20  CHRB         REAL                 KARD        REFS        11
     0  COMPF        REAL                 BLOCKB      REFS         3       116       124       199       205
     1  COMPR        REAL                 BLOCKB      REFS         3       116       125       260       266
    22  COMS         REAL       ARRAY     KARD        REFS        11
     0  DESIGN       REAL                 KARD        REFS        11
     3  DFI          REAL                 KARD        REFS        11
    17  DRYWT        REAL                 KARD        REFS        11
     2  FCOMPF       REAL                 BLOCKB      REFS         3       123       124       204       205
     3  FCOMPR       REAL                 BLOCKB      REFS         3       123       125       265       266
     1  FDE          REAL                 BSBLK       REFS         9   DEFINED       127       147       175       267       281
                                                       302
     0  FDEF         REAL                 BSBLK2      REFS        10   DEFINED       126       146       174       206       220
                                                       237
     6  FLEXPT       REAL                 KARD        REFS        11
    10  FLSF         REAL                 BLOCKB      REFS         3       143       144       218       219
    11  FLSR         REAL                 BLOCKB      REFS         3       143       145       279       280
    14  FRSURF       REAL                 BLOCKB      REFS         3       171       172       235       236
    15  FRSUBR       REAL                 BLOCKB      REFS         3       171       173       300       301
     0  I            INTEGER              F.P.     DEFINED         1        23  I/O REFS        73        74        75        79
                                                        80        83        85        87        88        89        90        91
                                                        92        93       106       107       110       112       113       114
                                                       116       117       119       121       123       128       130       131
                                                       134       136       137       138       139       140       141       142
                                                       143       148       149       150       153       155       158       160
                                                       161       162       163       164       166       169       170       171
                                                       177       178       182       183       186       188       189       192
                                                       194       196       197       198       199       200       201       203
                                                       204       207       208       209       211       212       213       214
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        SUBROUTINE OUTC        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420          09/02/77  13.54.00         PAGE     10

 VARIABLES       SN   TYPE               RELOCATION
                                                          215        216        217        218        221        222        223        224
                                                          226        228        229        230        231        232        233        234
                                                          235        238        239        242        243        246        247        249
                                                          251        253        255        257        258        259        260        261
                                                          262        264        265        268        269        270        272        273
                                                          274        275        276        277        278        279        282        283
                                                          284        285        287        289        290        291        292        293
                                                          295        298        299        300        304        305        316        317
                                                          318        321        322        323        324        325        327        328
                                                          329        330        331        332        334        335        336        338
                                                          339        340        342        343        344        346        347        348
                                                          349        350        352        353        354        356        357        358
                                                          360        361        363        364        365        366        367        369
                                                          371        373        374        375        376        377        455
   3663  IA          INTEGER                             REFS        342    DEFINED         20
   3664  IH          INTEGER                             REFS        338    DEFINED         21
      0  IRTE        INTEGER              BSRLK          REFS          9
   3665  IC          INTEGER                             REFS        334    DEFINED         22
      1  ICONFIG     INTEGER              KARD           REFS         11
     11  IFGRP       INTEGER              KARD           REFS         11         33         48         54       2*55         56
      2  IFLEXNA     INTEGER              BLOCKD         REFS          7        109      2*133      2*157        195      2*210      2*227
     12  IFSWIT      INTEGER     ARRAY    ABLK3          REFS          2
      1  IIPAVT      INTEGER              BLOCKC         REFS          6         70         71
      5  IPAVT       INTEGER              KARD           REFS         11         51
      3  IRIGDNA     INTEGER              BLOCKD         REFS          7        111      2*135        159        256      2*271        288
     14  ISUBCAR     INTEGER              KARD           REFS         11
     15  ISUBHOR     INTEGER              KARD           REFS         11         33         57         59
     15  ISWITF      INTEGER              BLOCKC         REFS          6         28       2*36         37         81         82         83
                                                          126        146        174        184        185        186        206        220
                                                          237        372
     16  ISWITR      INTEGER              BLOCKC         REFS          6         28       2*29         30       2*42         43         90
                                                           91         92         93        127        147        175        244        245
                                                          246        247        267        281        302        372
                                                      DEFINED         34
      0  ISWITX      INTEGER              BLOCKE         REFS          8         53
     26  LCIND       INTEGER              KARD           REFS         11
      2  MESS        INTEGER     ARRAY    BLOCKC         REFS          6      11*14
      0  MSGSW1      INTEGER              BLOCKC         REFS          6        113        197        258    DEFINED         69
     17  MSGSW2      INTEGER              BLOCKC         REFS          6         51        137        212        273
     20  MSGSW3      INTEGER              BLOCKC         REFS          6        161        229        290
   3666  MSG01       INTEGER                             REFS         50    DEFINED         31         44         65
   3667  MSG02       INTEGER                             REFS         62    DEFINED         38         46         63
      2  MSG1        INTEGER              BLOCKC         REFS         14        320    DEFINED         48
     13  MSG10       INTEGER              BLOCKC         REFS         14         27        368
     14  MSG11       INTEGER              BLOCKC         REFS         14         27        165        176        294        303        370
      3  MSG2        INTEGER              BLOCKC         REFS         14        326    DEFINED         51
      4  MSG3        INTEGER              BLOCKC         REFS         14        333    DEFINED         49
      5  MSG4        INTEGER              BLOCKC         REFS         14        337    DEFINED         54
      6  MSG5        INTEGER              BLOCKC         REFS         14        341    DEFINED         55
      7  MSG6        INTEGER              BLOCKC         REFS         14        345    DEFINED         25
     10  MSG7        INTEGER              BLOCKC         REFS         14        351    DEFINED         26
     11  MSG8        INTEGER              BLOCKC         REFS         14        355    DEFINED         58
     12  MSG9        INTEGER              BLOCKC         REFS         14        359    DEFINED         60
     27  OVH         REAL                 KARD           REFS         11
     16  PHOBTF      REAL                 BLOCKH         REFS          3
     20  PHOBTR      REAL                 BLOCKH         REFS          3
     17  PRFLTF      REAL                 BLOCKH         REFS          3
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        SUBROUTINE OUTC         74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE    11

VARIABLES       SN  TYPE               RELOCATION
   21  PRFLTR     REAL                     BLOCKB       REFS         3
    0  PVTFLX     REAL                     BLOCKD       REFS         7         119         124         141         144         166         169
                                                         172       201         205         216         219         233         236
    1  PVTRGD     REAL                     BLOCKD       REFS         7         119         125         141         145         169         173
                                                         262       266         277         280         298         301
    7  RIGDPT     REAL                     KARD         REFS        11
   12  RSUBF      REAL                     BLOCKB       REFS         3         163         172         231         236
   13  RSUBR      REAL                     BLOCKB       REFS         3         163         173         292         301
    4  SLSDRTF    REAL                     BLOCKB       REFS         3         139         144         214         219
    5  SLSDRTR    REAL                     BLOCKB       REFS         3         139         145         275         280
    6  SLSPENF    REAL                     BLOCKB       REFS         3         153         224
    7  SLSPENR    REAL                     BLOCKB       REFS         3         153         285
   12  SMOIST     REAL                     KARD         REFS        11
   13  SURMOD     REAL                     KARD         REFS        11
    4  TDFP       REAL                     KARD         REFS        11
    2  TRAFF      REAL                     KARD         REFS        11          49          52
   22  XTRA       REAL                     BLOCKB       REFS         3         362
       VARIABLES USED AS FILE NAMES, SEE ABOVE

STATEMENT LABELS                    DEF LINE   REFERENCES
  234  200                              85         82
  240  210                              87         81
  243  220                              88         84         86
    0  240               INACTIVE      106
  301  250                             111        109
  306  255                             113        111
  364  260                             135        133
  373  265                             137        135
  455  270                             159        157
  462  275                             161        159
  503  280                             169        165
  542  281                             179        176
 1215  282                             306        303
  506  290                             170        168
  544  300                             182         70
  564  310                             188        185
  567  320                             189        184
  572  330                             191        187        190
    0  350               INACTIVE      192
  604  360                             197        195
  652  370                             212        210
  724  380                             229        227
  762  400                             242         71
 1006  410                             249        245
 1012  420                             251        244
 1015  430                             252        248        250
    0  450               INACTIVE      253
 1027  452                             258        256
 1075  457                             273        271
 1145  462                             290        288
 1166  470                             298        294
 1171  480                             299        297
 1217  500                             316        180        240        307
 1243  510                             326        320
 1262  520                             333        326
 1273  530                             337        333
 1304  540                             341        337
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      SUBROUTINE OUTC        74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE    12

STATEMENT LABELS                   DEF LINE   REFERENCES
  1315  550                          345        341
  1332  560                          351        345
  1343  570                          355        351
  1354  580                          359        355
  1363  600                          362        359
  1400  700                          368        362
  1405  800                          370        368
  1412  900                          372        370
  1431  1000                         454        372
     0  5000          INACTIVE        25
    30  5001                          28         33        35
    45  5005                          33         27
    56  5010                          36         29        31        50        62        63
    71  5020                          40         36        38        42        44        46        50        62        65
    73  5030                          42         28
   106  5040                          46         43
   111  5100                          48         32        45        66
   123  5200                          51         39        47        64
   150  5210                          56         52        53
   165  5220                          61         56        57        59
   170  5230                          63         30
   173  5240                          65         37
   176  6000                          68         41
  1527  8000     FMT                  94        106
  1445  8001     FMT                  76         73
  1453  8002     FMT                  77         74
  1460  8003     FMT                  78         75
  1533  8010     FMT                  95         79       182
  1536  8020     FMT                  96         80        89       183       243
  1543  8030     FMT                  97         83        92       186       246
  1550  8035     FMT                  98         93       247
  1556  8040     FMT                  99         85        91       188       249
  1564  8050     FMT                 100         87        90       189       251
  1570  8052     FMT                 101         88       242
  1573  8060     FMT  NO REFS        102
  1575  8070     FMT                 103        363
  1604  8080     FMT                 104        113       137       161       197       212       229       258       273       290
  1613  8090     FMT                 105        367
  1630  8100     FMT                 108        107       194       255
  1651  8110     FMT                 115        114       138       162       198       213       230       259       274       291
  1700  8120     FMT                 120        116       119       123       130       139       141       143       149       163
                                                169       171       178
  1666  8125     FMT                 118        117       140       164       200       215       232       261       276       293
  1706  8130     FMT                 122        121       142       170       203       217       234       264       278       299
  1723  8135     FMT                 129        128       148       177       207       221       238       268       282       304
  1740  8140     FMT                 132        131       209       270
  2023  8150     FMT                 151        150       223       284
  2040  8160     FMT                 154        153
  2046  8170     FMT                 156        155       226       287
  2104  8200     FMT                 167        166
  2612  8210     FMT                 308        112       136       160       257       272       289
  2615  8220     FMT                 309        110       134       158       196       211       228
  2620  8230     FMT                 310        316
  2632  8240     FMT                 312        317
  2160  8300     FMT                 193        192
  2212  8310     FMT                 202        199       201       204       208       214       216       218       222       231
                                                233       235       239
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        SUBROUTINE OUTC         74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE    13

 STATEMENT LABELS                  DEF LINE   REFERENCES
  2307  8320    FMT                  225       224
  2404  8400    FMT                  254       253
  2436  8410    FMT                  263       260       262       265       269       275       277       279       283       292
                                               298       300       305
  2533  8420    FMT                  286       285
  2564  8450    FMT                  296       295
  2665  8500    FMT                  319       318
  3126  8510    FMT                  381       321
  3137  8511    FMT                  383       322
  3150  8512    FMT                  385       323
  3161  8513    FMT                  387       324
  3171  8514    FMT                  389       325
  3201  8520    FMT                  391       327
  3212  8521    FMT                  393       328
  3223  8522    FMT                  395       329
  3230  8523    FMT                  396       330
  3237  8524    FMT                  397       331
  3245  8525    FMT                  398       332
  3254  8530    FMT                  399       334       338       342
  3265  8531    FMT                  401       335       339       343
  3276  8532    FMT                  403       336       340       344
  3305  8540    FMT                  404       346
  3317  8541    FMT                  406       347
  3330  8542    FMT                  408       348
  3341  8550    FMT                  410       352
  3352  8551    FMT                  412       353
  3364  8552    FMT                  414       354
  3375  8560    FMT                  416       356
  3407  8561    FMT                  418       357
  3420  8562    FMT                  420       358
  3425  8570    FMT                  421       360
  3437  8571    FMT                  423       361
  3101  8580    FMT                  378       364
  3110  8581    FMT                  379       365
  3117  8582    FMT                  380       366
  3450  8610    FMT                  425       455
  3461  8620    FMT                  427       349
  3472  8621    FMT                  429       350
  3504  8630    FMT                  431       373
  3515  8631    FMT                  433       374
  3526  8632    FMT                  435       375
  3537  8633    FMT                  437       376
  3546  8634    FMT                  439       377
  3605  8640    FMT                  445       371
  3626  8650    FMT                  449       369

 COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
        ABLK3        20               0 AKEFT   (10)                10 IFSWIT (10)
        BLOCKB       19               0 COMPF   (1)                  1 COMPR   (1)                 2 FCOMPF (1)
                                      3 FCOMPR (1)                   4 SLSDBTF(1)                  5 SLSDBTR(1)
                                      6 SLSPENF(1)                   7 SLSPENR(1)                  8 FLSF    (1)
                                      9 FLSR    (1)                 10 RSUBF   (1)                11 RSUBR   (1)
                                     12 FRSUBF  (1)                 13 FRSUBR  (1)                14 PRDBTF  (1)
                                     15 PRFLTF  (1)                 16 PRDBTR  (1)                17 PRFLTR  (1)
                                     18 XTRA    (1)
        BLOCKC       17               0 MSGSW1  (1)                  1 IIPAVT  (1)                 2 MESS    (11)
                                     13 ISWITF  (1)                 14 ISWITR  (1)                15 MSGSW2  (1)
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          SUBROUTINE OUTC        74/74    OPT=0 ROUND=*/ TRACE           FTN 4.6+420          09/02/77  13.54.00          PAGE     14

      COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
                                           16 MSGSW3 (1)
          BLOCKD          4                 0 PVTFLX (1)                  1 PVTRGD (1)                     2 IFLEXNA(1)
                                            3 IRIGONA(1)
          BLOCKE          1                 0 ISWITX (1)
          BSALK           2                 0 IRTE   (1)                  1 FDE    (1)
          BSALK2          1                 0 FDEF   (1)
          KARD           24                 0 DESIGN (1)                  1 ICONFIG(1)                     2 TRAFF  (1)
                                            3 DFI    (1)                  4 TDFP   (1)                     5 IPAVT  (1)
                                            6 FLEXPT (1)                  7 RIGDPT (1)                     8 AMINOR (1)
                                            9 IFGRP  (1)                 10 SMOIST (1)                    11 SUBMOD (1)
                                           12 ISUBCBR(1)                 13 ISUBHOR(1)                    14 BMOIST (1)
                                           15 DRYWT  (1)                 16 CBR8   (1)                    17 CHR10  (1)
                                           18 COMS   (4)                 22 LCIND  (1)                    23 OVR    (1)

      EQUIV CLASSES   LENGTH      MEMBERS - BIAS NAME(LENGTH)
     MSGSW1  MESS        11                 0 MSG1   (1)                  1 MSG2   (1)                     2 MSG3   (1)
                                            3 MSG4   (1)                  4 MSG5   (1)                     5 MSG6   (1)
                                            6 MSG7   (1)                  7 MSG8   (1)                     8 MSG9   (1)
                                            9 MSG10  (1)                 10 MSG11  (1)

      STATISTICS
        PROGRAM LENGTH              3672B    1978
        CM LABELED COMMON LENGTH     130B      88
      OVERLAY(LIFE.6,0)
      PROGRAM RL
      DIMENSION LINE(50),YINTER(50),SLOPE(50).LIMITL(50),LIMITU(50).
     1L10(50)
      DIMENSION TATAL(35),XTHICK(10)
      DIMENSION ITYPE(10).ITHICK(10)
      DIMENSION JCOMB(30)
      DIMENSION RSTRT(10).FSTRT(10).STRT(10)
      DIMENSION RTMO(10.4).FTMO(10,4).TMO(10,4)
      DIMENSION TMT(20).IX(20)
      DIMENSION ILINE(10).INCHES(10),IYEAR(10),JBOND(10)
      DIMENSION SUMCNST(30).SUMAINT(30),SUMALL(30),ISCHEME(30),ISTRAGY(3
     10)
      DIMENSION IARF(3)
      DIMENSION DSMAINT(30)
      COMMON /ARBK/ AREA
      COMMON /CSTBK/ CCCST(50.10,2)
      COMMON /COSR/ DLCF.DLCR
      COMMON /DMBLK/ TRST
      COMMON /DDBK/ ID.ITY.DT20.DT
      COMMON /DRNBLK/ DRNCST.DRAIN
      COMMON /FLAG/ JCOND
      COMMON/HBLK/HH(10).TM(20).AHH(10)
      COMMON/LCY/AXK,YK,TRY(20).FAC.LS.XCBR,XSTR
      COMMON /LYTD/ NNAT.YCBR(10.4),NCOM,ZCBR(10,6),NSBB,XMT(10,6).
     1NB,ZMT(3.4)
      COMMON /MANLK/ JMANQ.MLYST
      COMMON /MIXBLK/ STORO(10.10),STOREE(10.10).COVRGQ(10,20).IMIX
      COMMON/MXBLK/IGINT.ICBR
      COMMON /NANLK/ NLYST
      COMMON/NBLK/NOG,NOH,NPT,NX.NY,NOD,NOSG.XK
      COMMON/PQZ/TRPQZ(20)
      COMMON /PRVNT1/ ISKIP.JISKIP,IVM
      COMMON /RDSTR/ IMANQ.NUMS.NOO(10).CSTRT(10,6)
      COMMON /RESTR/ IREST.JREST
      COMMON /RLMN/ JTYPE(3,10).NOACFT(50.10)
      COMMON /RL1/ K7.K4.EARTHWK,IDENT(3).FACTOR
      COMMON /RL2/ NAME(5).LOCATE(8),IDSCRPT(30.10),DSCRPT(3,50).CHAR(7,
     150)
      COMMON /RODLOD/IDR.LZ.IDF
      COMMON /SCAN3/ JDL
      COMMON/SG5WP2/XFP(20.10)
      COMMON/THKBK/THFF(20).TRKK(20)
      COMMON /TMPL/ IND.SWID.TWOCL.JACK
      COMMON/TSV/THCK.ERCOST.PSTEP.CUTPRCE.FILPRCE,NERTH
      COMMON /TTL/TATAL
      COMMON/WES/ESWL(10,20).AESWL(10).WHEELS(10).CBR(20)
      INTEGER Z
      INTEGER W
      DATA IARF /1HR,1HF.1H /
C     DESCRIPTION OF VARIABLES
C     K1          NUMBER OF TYPES OF AIRCRAFT ON WHICH DESIGN WILL BE BASED.
C     K2          NUMBER OF PARAMETERS FOR ESTIMATING CONSTRUCTION COSTS.
C     K3          NUMBER OF PARAMETERS FOR ESTIMATING MAINTENANCE COSTS.
C     K4          NUMBER OF CONSTRUCTION SCHEMES TO BE EVALUATED.
C     K5          NUMBER OF STRATEGIES EVALUATED FOR A GIVEN SCHEME.
C     K6          NUMBER OF SECTIONS FOR A GIVEN SCHEME.
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C     K7        NUMBER OF LINES IN PROJECT DESCRIPTION.
C     K8        NUMBER OF LAYERS FOR A GIVEN SECTION.
C     M1        LINE NUMBER - MAINTENANCE PARAMETER APPLICABLE BEFORE 1ST OVERLAY
C     M2        LINE NUMBER - MAINTENANCE PARAMETER APPLICABLE AFTER 1ST OVERLAY
      DO 301 I=1.50
      IF(DSCRPT(1.I).NE.10H          ) GO TO 301
      DO 302 J=1.3
      DSCRPT(J.I)=DSCRPT(J.I-1)
  302 CONTINUE
  301 CONTINUE
      DO 150 JH=1.30
  150 SUMALL(JH)=999999999.
      JC=0
C
C         READ INPUT CONTROL PARAMETERS
C
  900 FORMAT(2X.8F10.2)
  901 FORMAT(5X.2(5X.F10.4).5X.2(5X.I10))
  902 FORMAT("  *****  RL DEBUG  *****")
  910 FORMAT("   EARTHWK =",F10.2," DRAIN =",F10.2)
  990 FORMAT(5I5)
 1000 FORMAT(1H1)
 1001 FORMAT(1H )
 1002 FORMAT(1H0)
 1005  FORMAT(2X.///////,5X."THE PROJECTED ANNUAL COST OF  VEHICLE MAINTE
     1NANCE ATTRIBUTABLE TO PAVEMENT CONDITION OF THE GIVEN PAVEMENT SYS
     1TEM IS GIVEN BY"//.10X."ANNUAL COST($)=(GEOGRAPHIC FACTOR)X(INTERC
     1EPT)+(SLOPE)X(NUMBER OF YEARS SINCE CONSTRUCTION OF LAST OVERLAY))
     1"//                            . 1X."SUBJECT TO THE CONSTRAINT THAT
     1 THE NUMBER OF YEARS SINCE ORIGINAL CONSTRUCTION OR LAST OVERLAY F
     1ALLS WITHIN"/ .1X,"THE UPPER AND LOWER LIMITS SPECIFIED FOR A GIVE
     1N LINE.")
 1010  FORMAT(25X.81HLIFE CYCLE COST PROJECTIONS FOR DESIGN SCHEMES PROPO
     1SED FOR THE NEW PAVEMENT      /////)
 1011  FORMAT(22X.86HMAINTENANCE COST PROJECTIONS FOR MAINTENANCE STRATEG
     1IES FOR THE EXISTING PAVEMENT      /////)
 1012  FORMAT(32X.76HDESIGN COST ESTIMATION FOR DESIGN SCHEMES PROPOSED F
     1OR THE NEW PAVEMENT      /////)
 1013  FORMAT(2X.6HBASE: .5A4.35X.10HLOCATION: .8A4///.2X.31HPROJECT IDEN
     1TIFICATION NUMBER: .3A4.18X.19HGEOGRAPHIC FACTOR: .F6.4/////.48X.
     119HPROJECT DESCRIPTION//)
 1020 FORMAT(2X.30A4)
 1030  FORMAT(2X.//////////////.10X.110HTHIS DOCUMENT PROVIDES COST ESTIMA
     1TES OF VARIOUS DESIGN SCHEMES TO SUPPORT TRAFFIC PROGRAMMED FOR TH
     1E PROPOSED/.2X.48HFACILITY TO SATISFY OPERATING REQUIREMENTS FOR A
     1.I3.1X.12HYEAR PERIOD.//90X."DATE OF PREPARATION:".A11)
 1031  FORMAT(2X.//////////////.10X."THIS DOCUMENT PROVIDES COST ESTIMATES
     1 OF VARIOUS MAINTENANCE STRATEGIES TO SUPPORT TRAFFIC PROGRAMMED F
     1OR THE"/.2X."PROPOSED FACILITY TO SATISFY OPERATING REQUIREMENTS F
     1OR A".I3,1X."YEAR PERIOD."/.2X."FUTURE COSTS ARE DISCOUNTED TO PRO
     1VIDE A BASIS FOR COMPARISON. THE INTEREST RATE USED IS",1X,F4.3.//
     190X."DATE OF PREPARATION:".A11)
 1032  FORMAT(2X.//////////////.10X.120HTHIS DOCUMENT PROVIDES COST ESTIMA
     1TES OF VARIOUS DESIGN SCHEMES AND MAINTENANCE STRATEGIES TO SUPPOR
     1T TRAFFIC PROGRAMMED/.2X.65HFOR THE PROPOSED FACILITY TO SATISFY O
     1PERATING REQUIREMENTS FOR A.I3.1X.12HYEAR PERIOD./.1X .  "FUTURE C
     1OSTS ARE DISCOUNTED TO PROVIDE A BASIS FOR COMPARISON. THE INTERES
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      IT RATE USED IS",1X,F4.3//90X,"DATE OF PREPARATION:",A11)
 1333 FORMAT(2X,//////,10X," THIS PROGRAM IS FURNISHED BY THE GOVERNMENT
     1 AND IS ACCEPTED AND USED BY THE RECIPIENT WITH THE EXPRESS UNDERS
     1TANDING"/,2X,"THAT THE UNITED STATES GOVERNMENT MAKES NO WARRANTIE
     1S, EXPRESSED OR IMPLIED, CONCERNING THE ACCURACY, COMPLETENESS, RE
     1LI-"/,2X,"ABILITY, USEABILITY, OR SUITABILITY FOR ANY PARTICULAR P
     1URPOSE OF THE INFORMATION AND DATA CONTAINED IN THIS PROGRAM OR"/,
     12X,"FURNISHED IN CONNECTION THEREWITH, AND THE UNITED STATES SHALL
     1 BE UNDER NO LIABILITY WHATSOEVER TO ANY PERSON BY REASON"/,2X,
     1"OF ANY USE MADE THEREOF.  THE PROGRAM BELONGS TO THE GOVERNMENT.
     1  THEREFORE, THE RECIPIENT FURTHER AGREES NO TO ASSERT ANY"/,2X,
     1"PROPRIETARY RIGHTS THEREIN OR TO REPRESENT THIS PROGRAM TO ANYONE
     1 AS OTHER THAN A GOVERNMENT PROGRAM.")
 1033  FORMAT(" ",//" ","REQUIRED THICKNESS OF PROTECTION VERSUS SERVICE
     1LIFE RELATIONSHIP FOR FLEXIBLE PAVEMENT MATERIALS WITH CBR-S  USED
     1 IN THIS RUN",//" ","DENSITY AND/OR FROST REQUIREMENTS MAY CONTROL
     2 THICKNESS REQUIREMENTS")
 1035  FORMAT(////" ","TOTAL FLEXIBLE PAVEMENT THICKNESS VERSUS SERVICE L
     1IFE RELATIONSHIP FOR THE SUBGRADE CBR USED IN THIS RUN")
 1036  FORMAT(////" ","RIGID PAVEMENT THICKNESS(PCC) VERSUS SERVICE LIFE
     1RELATIONSHIP FOR THE SUBGRADE MODULUS(K) USED IN THIS RUN")
 1037  FORMAT(//" ",25X,"SERVICE LIFE"//" ",2X,"CBR",5X,20(F3.0,3X)//)
  1038 FORMAT(//2X,F4.0,3X,20(1X,F5.1))
 1040  FORMAT(//" ",25X,"SERVICE LIFE"//" ",2X,"SUBGRADE"/" ",2X,"MODULUS
     1",3X,20(F3.0,3X)//)
  1041 FORMAT(//3X,F4.0,3X,20(1X,F5.1))
  1100 FORMAT(30X,"AIRCRAFT TRAFFIC PROJECTIONS"///,
     12X,"YEAR",5X,6(3A4)/)
  1110 FORMAT(3X,I2,1X,5I10)
  1115 FORMAT(//"  ONLY SIX AIRCRAFT ARE SHOWN. THE REMAINDER MAY BE FOUN
     1D LISTED ON THE INPUT PAGE.")
  1120 FORMAT(2X,//////////,10X,"NUMBERS SHOWN ARE PASSES PROJECTED DURIN
     1G EACH YEAR FOR THE PAVEMENT UNDER CONSIDERATION."/,
     22X,"ONE PASS IS ONE TAKEOFF PLUS ONE LANDING.")
 1200  FORMAT(40X,"PARAMETERS FOR ESTIMATING CONSTRUCTION COSTS"///,18X,
     1"ITEM",18X,"CHARACTERISTICS",14X,"UNIT",2X,"INTERCEPT",5X,"SLOPE"
     1,3X,"LOWER LIMIT",2X,"UPPER LIMIT",4X,"UNIT"//)
  1210 FORMAT(11X     ,2A10,A6,2X,7A4,2X,"$/SY",1X,F8.4,4X,F8.4,6X,I3,
     111X,I3,9X,"IN")
 1220  FORMAT(2X,//////,10X,63HTHE COST FOR A GIVEN LAYER OF A SECTION OF
     1 PAVEMENT IS GIVEN BY//,15X,78HCOST($) = (AREA(SY))X(GEOGRAPHIC FA
     1CTOR)X((INTERCEPT)+(SLOPE)X(THICKNESS(IN)))//,1X ,108HSUBJECT TO T
     1HE CONSTRAINT THAT THE THICKNESS OF THE LAYER FALLS BETWEEN THE UP
     1PER AND LOWER LIMITS SPECIFIED/,1X,17HFOR A GIVEN LINE.)
 1300  FORMAT(40X,"PARAMETERS FOR ESTIMATING MAINTENANCE COSTS"///,16X,
     1"MAINTENANCE",13X,"CHARACTERISTICS",13X,"UNIT",2X,"INTERCEPT",
     15X,"SLOPE",3X,"LOWER LIMIT",2X,"UPPER LIMIT",4X,"UNIT"//)
 1310  FORMAT(  11X    ,2A10,A6,2X,7A4,1X,4H$/SY,1X,F8.4,4X,F8.4,6X,I3,11X
     1,I3,9X,2HYR)
  1320 FORMAT(2X,//////,10X,"THE PROJECTED ANNUAL COST TO MAINTAIN A GIVE
     1N SECTION OF PAVEMENT FOLLOWING EITHER INITIAL CONSTRUCTION OR"/,
     21X,"AN OVERLAY IS GIVEN BY"//,
     310X,"ANNUAL COST($)=(GEOGRAPHIC FACTOR)X(AREA(SY))X((INTERCEPT)+(S
     4LOPE)X(NUMBER OF YEARS SINCE CONSTRUCTION OR LAST OVERLAY))"//,
     5 1X,"SUBJECT TO THE CONSTRAINT THAT THE NUMBER OF YEARS SINCE ORIG
     6INAL CONSTRUCTION OR LAST OVERLAY FALLS WITHIN THE UPPER AND"/,
     71X,"LOWER LIMITS SPECIFIED FOR A GIVEN LINE.")
 1330  FORMAT(11X.2A10.A6.2X.7A4.2X.1H$.4X.F9.2.3X.F9.2.3X.I3.11X.I3.10X.
      12HYR)
 1341  FORMAT(5X.45HTHE USER HAS SPECIFIED THE MAINTENANCE OPTION//)
 1342  FORMAT(5X.40HTHE USER HAS SPECIFIED THE DESIGN OPTION//)
 1343  FORMAT(5X.44HTHE USER HAS SPECIFIED THE LIFE CYCLE OPTION//)
 1344  FORMAT(5X.99HTHE FOLLOWING STRATEGIES AND THEIR CORRESPONDING TIME
      1S OF OVERLAYS ARE SPECIFIED IN TERMS OF YEARS:/)
 1345  FORMAT(5X.8HSTRATEGY.2X.I2.2X.6F5.0//)
 1346  FORMAT(1X.//.5X."THE CONCRETE FLEXURAL STRENGTH IS".F6.0.1X."P.S.I
      1"//5X."THE SUBGRADE MODULUS K IS".F5.0.1X."P.C.I."//5X."THE SUBGRA
      1DE CBR IS".F6.0//5X."THE AREA IN PLAN IS",F9.0,"SQ YDS"//)
  1388 FORMAT(//.9X."IN GENERAL BASE CBR=50 IS ONLY USED FOR CLASS E & F
      1ROADS AND STREETS.(REF. TM 5-822-5/AFM 88-7.CHAP.3 TABLE 2)")
  1400 FORMAT(20X."FLEXIBLE CONSTRUCTION COST ANALYSIS FOR SCHEME".I2.1X.
      1"ASSOCIATED WITH OVERLAY STRATEGY".I2//)
  1401 FORMAT(20X."RIGID CONSTRUCTION COST ANALYSIS FOR SCHEME".I2.1X.
      1"ASSOCIATED WITH OVERLAY STRATEGY".I2//)
  1402 FORMAT(40X. " FLEXIBLE CONSTRUCTION COST ANALYSIS FOR SCHEME".I2)
  1403 FORMAT(40X." RIGID CONSTRUCTION COST ANALYSIS FOR SCHEME",I2)
  1410 FORMAT(2X//
      12X."LAYER NO".10X."DESCRIPTION"9X."THICKNESS(IN)".7X."COST/SY".22X
      2. "TOTAL COST"./)
  1420 FORMAT(5X.I2.5X.2A10.A6.6X.F4.1.12X.F6.2.23X.F10.2)
  1430 FORMAT(/4X."TOTAL THIS SECTION".22X.F4.1.12X.F6.2.20X."$".F12.2)
  1440 FORMAT(2X."TOTALS FOR ALL SECTIONS".15X."AREA = ".I8." SY",50X."CO
      1STS = $".F11.2//.
      22X."EARTHWORK COSTS".99X."$".F11.2//.
      22X."DRAINAGE COSTS".100X."$".F11.2//.
      22X."TOTAL ALL CONSTRUCTION",92X."$",F11.2)
  1500 FORMAT(33X."SUBOPTIMIZED SOLUTION FOR OVERLAY STRATEGY".I2///.
      22X."YR".5X."MAINTENANCE COST".3X."OVERLAY THICKNESS(IN)".5X."OVERL
      3AY COST"[illegible]"USER COSTS".10X."TOTAL COST".9X."  ADJUSTED COST"/)
  1510 FORMAT(2X.I2.8X.F11.2.14X.I2.1X.A1.1X."(".I2.")".8X.F11.2.9X.F11.2
      1.9X.F11.2.12X.F11.2)
  1511 FORMAT(2X.I2.8X.F11.2.14X.I2.1X.A1.1X."(".A1.")".9X.F11.2.9X.F11.2
      1.9X.F11.2.12X.F11.2)
  1512 FORMAT(2X.I2.8X.F11.2.14X.I2.1X.A1.13X.F11.2.9X.F11.2.9X.F11.2.
      112X.F11.2)
  1520 FORMAT(2X."TOTALS".2X,"$".F12.2.14X.I2.13X."$".F12.2.7X."$".F12.2.
      17X."$".F12.2.10X."$".F12.2)
  1530 FORMAT(50X."SUMMARY OF ALL OVERLAY STRATEGIES"/
      140X."RANKED IN ASCENDING ORDER OF TOTAL   ADJUSTED COSTS"///
      22X."RANK".20X."STRATEGY NUMBER".25X."TOTAL STRATEGY COST".20X.
      3"TOTAL   ADJUSTED COSTS"/)
  1540 FORMAT(5X.I2.16X.I2.16X.F11.2.20X.F11.2.18X.F11.2)
  1550 FORMAT(30X."SUMMARY OF FLEXIBLE CONSTRUCTION SCHEMES AND CORRESPON
      1DING OVERLAY STRATEGIES"/
      237X."IN ASCENDING ORDER OF TOTAL ADJUSTED COSTS"///.
      32X."SCHEME NO".8X."STRATEGY NO".8X."CONSTRUCTION COST".10X."  ADJU
      4STED STRATEGY COST".6X."TOTAL   ADJUSTED COSTS"./)
  1570 FORMAT(30X."SUMMARY OF RIGID CONSTRUCTION SCHEMES AND CORRESPONDIN
      1G OVERLAY STRATEGIES"/
      237X."IN ASCENDING ORDER OF TOTAL   ADJUSTED COSTS"///.
      32X."SCHEME NO".8X."STRATEGY NO",8X."CONSTRUCTION COST".10X."  ADJU
      4STED STRATEGY COST".6X."TOTAL   ADJUSTED COSTS"./)
  1580 FORMAT(45X."SUMMARY OF RIGID CONSTRUCTION SCHEMES"/.47X."IN ASCEND
      1ING ORDER OF TOTAL COSTS"///.27X."RANK".35X."SCHEME NO".36X."CONST
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     2RUCTION COST"/)
 1585 FORMAT(45X,"SUMMARY OF FLEXIBLE CONSTRUCTION SCHEMES"/47X,"IN ASCE
     1NDING ORDER OF TOTAL COSTS"///27X,"RANK",35X,"SCHEME NO",36X,"CONS
     2TRUCTION COST"/)
 1590 FORMAT(28X,I2,39X,I2,43X,F11.2)
 1600 FORMAT(///2X, "THIS STRATEGY IS APPROPRIATE FOR USE WITH A RIGID D
     1ESIGN "/)
 1700 FORMAT(///2X, "THIS STRATEGY IS APPROPRIATE FOR USE WITH SEVERAL F
     1LEXIBLE DESIGNS "/)
 1710 FORMAT(2X,I2,8X,F11.2,31X,F11.2,9X,F11.2,9X,F11.2,12X,F11.2)
 1720 FORMAT(4X,I2,27X,I2,30X,F11.2,30X,F11.2)
 1721 FORMAT(1X,/2X,"F OR R REPRESENTS FLEXIBLE OR RIGID OVERLAYS"//,2X,
     1"A NUMBER IN PARENTHESES FOLLOWING FLEXIBLE IS THE THICKNESS OF BA
     1SE MATERIAL IN THE OVERLAY SYSTEM"//2X,"FOR RIGID, P IN PARENTHESE
     1S MEANS PARTIAL BOND AND U MEANS UNBONDED"//)
 1722 FORMAT(5X," SINCE THE EXISTING PAVEMENT IS IN A STATE OF COMPLETE,
     1FAILURE, A FLEXIBLE OVERLAY IS NOT CONSIDERED. IT IS SUGGESTED THA
     2T"/" RECONSTRUCTION BE INVESTIGATED - I.E. THAT A LIFE,CYCLE OPTIO
     3N BE RUN")
 1800 FORMAT(/////)
      NERTH=0
      W=6
      Z=8
      K4=(NLYST*MLYST*NB+1)*NUMS
      IF(NLYST.EQ.0) K4=(MLYST*NB+1)*NUMS
      IF(MLYST.EQ.0) K4=(NLYST*NB+1)*NUMS
      IF((MLYST.EQ.0).A.(NLYST.EQ.0)) K4=(NB+1)*NUMS
      LPCT=K4
      WRITE(W,902)
      WRITE(W,990) K7,K4
      IBSTHK=0
      K1=IMIX
      K2=NCOM+NSBB+NB+7
      K3=K2+5
      K2=CCCST(K2,1,2)+CCCST(K2,1,1)-1
      K3=CCCST(K3,1,2)+CCCST(K3,1,1)-1-K2
      WRITE(W,990) K2,K3
      WRITE(W,910) EARTHWK,DRAIN
      L1=K2+1
      L2=K2+K3
      L5=NCOM+NSBB+NB+12
      DO 151 I=1,L5
      L3=INT(CCCST(I,1,1)+.1)
      L3=L3+2
      WRITE(W,900) ((CCCST(I,J,K),K=1,2),J=1,L3)
  151 CONTINUE
      XINTRS=TRST
C
      CALL DATE (A)
C
      J=1
      L8=L5
      DO 1 I=1,L5
      L9=INT(CCCST(I,1,1)+.1)
      IF(L9.NE.0) GO TO 60
      L8=L8-1
      GO TO 1
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60    L10(J)=I
      J=J+1
1     CONTINUE
      DO 2 I=1,L2
      LINE(I)=I
      J=L8
      L=1
      L12=L10(J)
      L6=INT(CCCST(L12,1,2)+.1)
      DO 3 K=1,J
      IF(L.EQ.2) GO TO 3
      L11=L10(K)
      L4=INT(CCCST(L11,1,2)+.1)
      IF(L4.GT.I) GO TO 4
      GO TO 3
4     M=L10(K-1)
      L=2
3     CONTINUE
      IF(I.GE.L6) M=L12
      N=I-INT(CCCST(M,1,2)+.1)+1
      N=N+1
      K=N+1
      SLOPE(I)=(CCCST(M,K,2)-CCCST(M,N,2))/(CCCST(M,K,1)-CCCST(M,N,1))
      YINTER(I)=CCCST(M,N,2)-SLOPE(I)*CCCST(M,N,1)
      LIMITL(I)=INT(CCCST(M,N,1)+.1)
      LIMITU(I)=INT(CCCST(M,K,1)+.1)
      WRITE(W,901) YINTER(I),SLOPE(I),LIMITL(I1,LIMITU(I)
2     CONTINUE
      WRITE (7,1000)
      IF((IREST.EQ.2).AND.(JREST.EQ.2)) GO TO 27
      WRITE(7,1033)
      WRITE(7,1037)(TM(J6),J6=1,LS)
      DO 81 J3=1,ICBR
      WRITE(7,1038) CBR(J3),(XFP(J5,J3),J5=1,LS)
81    CONTINUE
      WRITE(7,1035)
      WRITE(7,1037)(TM(J6),J6=1,LS)
      WRITE(7,1038) XCBR,(THFF(J4),J4=1,LS)
27    IF((IREST.EQ.3).AND.(JREST.EQ.3)) GO TO 28
      WRITE(7,1036)
      WRITE(7,1040)(TM(J6),J6=1,LS)
      WRITE(7,1041) XK,(TRPQZ(J8),J8=1,LS)
28    WRITE(7,1000)
      GO TO(1351,1352,1353),ID
1351  WRITE(7,1341)
      GO TO 1354
1352  WRITE(7,1343)
      GO TO 1354
1353  WRITE(7,1342)
      GO TO 1361
1354  WRITE(7,1344)
      DO 1360 J1=1,NUMS
      J7= NOO(J1)
      WRITE(7,1345)J1,(CSTRT(J1,J2),J2=1,J7)
1360  CONTINUE
1361  WRITE(7,1346) XSTR,XK,XCBR,AREA
      DO 50 I=1,NB
      IF((ZMT(I,1).GE.50).A.(ZMT(I,1).LT.80)) WRITE(Z,1388)
 50   CONTINUE
      WRITE(Z,1000)
      GO TO(1014,1015,1016),ID
1014  WRITE(7,1011)
      GO TO 1017
1015  WRITE(7,1010)
      GO TO 1017
1016  WRITE(7,1012)
1017  WRITE(7,1013)(NAME(KA),KA=1,5),(LOCATE(KB),KB=1,8),(IDENT(KB),KB=
     11,3),FACTOR
      WRITE(7,1020) ((IDSCRPT(II,NN),II=1,30),NN=1,K7)
      GO TO (61,62,63),ID
 61   WRITE(Z,1031) JDL,XINTRS,A
      GO TO 64
 62   WRITE(Z,1032)JDL,XINTRS,A
      GO TO 64
 63   WRITE(Z,1030) JDL,A
   64 WRITE(7,1333)
      WRITE(7,1000)
      IF(L7.EQ.3) GOTO 1999
      KLA=K1
      IF(K1.GT.6)KLA=6
      WRITE(7,1100) ((JTYPE(IL,JK),IL=1,3),JK=1,KLA)
      WRITE(7,1001)
      DO 201 NL=1,JDL
      WRITE(7,1110) NL,(NOACFT(NL,JL),JL=1,K1)
 201  CONTINUE
      IF(K1.GT.KLA)WRITE(7,1115)
      WRITE(7,1120)
      WRITE(7,1000)
1999  CONTINUE
      WRITE(7,1200)
      WRITE(7,1210)              ((DSCRPT(KB,KA),KB=1,3),(CHAR(KC,KA),KC=1,7
     1),YINTER(KA),SLOPE(KA),LIMITL(KA),LIMITU(KA),KA=1,K2)
      WRITE (7,1220)
      IF(ID.EQ.3) GO TO 40
      IF(JISKIP.NE.1) GO TO 41
      GO TO 42
 41   IF(IVM.NE.1) GO TO 40
 42   WRITE(7,1000)
      L13=0
      L18=0
      IXY=0
      KAB=0
      DO 30 KA=L1,L2
      KKNT=0
      KAB=KAB+1
      IF(DSCRPT(1,KA).EQ.10HVEHICLE MA)IXY=1
      IF(DSCRPT(1,KA).EQ.10HROUTINE MA) IXY=0
      IF(KAB.EQ.1.AND.IXY.EQ.0) KKNT=1
      IF(KKNT.EQ.1) WRITE(Z,1300)
      IF(IXY.EQ.1) GO TO 31
      WRITE(7,1310) (DSCRPT(KB,KA),KB=1,3),(CHAR(KC,KA),KC=1,7),YINTER(K
     1A),SLOPE(KA),LIMITL(KA),LIMITU(KA)
      GO TO 30
 31   L18=L18 + 1
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      IF(L18.LE.1) L15=KA
   30 CONTINUE
      IF(KKNT.EQ.1) WRITE(2,1320)
      IF(IXY.NE.1) GO TO 40
      WRITE(7,1000)
      L17=L15+(L18-1)
      WRITE(7,1300)
      DO 221 L16=L15,L17
      WRITE(7,1330) (DSCRPT(KB,L16),KB=1,3),(CHAR(KC,L16),KC=1,7),
     1YINTER(L16),SLOPE(L16),LIMITL(L16),LIMITU(L16)
  221 CONTINUE
      WRITE(7,1005)
   40 CONTINUE
      REWIND 7
C
C     ESTABLISH DO LOOP FOR STRATEGIES
C
      IF(ID.NE.3) K5=NUMS
      IF(ID.EQ.3) K5=1
      MMMM=0
      MM=0
      DO 100 MM=1,K5
      IF((ID.EQ.3).OR.(IREST.EQ.3)) GO TO 202
      READ(7)NRSTRT,(RSTRT(I),(RTMO(I,J),J=1,4),I=1,NRSTRT)
  202 IF(ID.EQ.1) GO TO 203
      READ(7) ICK
      IF(IREST.EQ.3) GO TO 203
      IF(ICK.EQ.1) READ(7) TT,T1,SVCOST
  203 IF((ID.EQ.3).OR.(IREST.EQ.2)) GO TO 204
      READ(7) NFSTRT,(FSTRT(I),(FTMO(I,J),J=1,4),I=1,NFSTRT)
  204 CONTINUE
      IAREA=INT(AREA+.1)
      LLLAREA=IAREA
      IF(ID.EQ.3) GO TO 205
      LIMU=2
      IF ((IREST.GT.1).OR.(ID.EQ.1)) LIMU=1
      DO 200 LLL=1,LIMU
      MMMM=MMMM+1
      IF(IREST.NE.1) IXY=IREST-1
      IF((IREST.EQ.1).A.((MMMM/2)*2.EQ.MMMM)) IXY=2
      IF((IREST.EQ.1).A.((MMMM/2)*2.NE.MMMM))IXY=1
      IF(ID.EQ.1) TT=DT
      IF((ID.EQ.1).AND.(ITY.EQ.2)) GO TO 71
      IF((ID.NE.1).AND.(IREST.EQ.3)) GO TO 71
      IF((ID.NE.1).AND.(IREST.EQ.1).AND.(LLL.EQ.2)) GO TO 71
      NNNN=NRSTRT
      CALL PREVFN2(RTMO,RSTRT,NRSTRT,DTOTAL,MMMM,TT,IXY)
      DO 72 I=1,NNNN
      IF(I.GT.1) GO TO 73
      STRT(1)=RSTRT(1)
      GO TO 78
   73 STRT(I)=RSTRT(I)-RSTRT(I-1)
   78 DO 72 J=1,4
      TMO(I,J)=RTMO(I,J)
   72 CONTINUE
      GO TO 74
   71 NNNN=NFSTRT
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      CALL PREVEN2(FTMO.FSTRT.NFSTRT.DTOTAL.MMMM.TT.IXY)
      DO 5 I=1.NNNN
      IF(I.GT.1) GO TO 6
      STRT(1)=FSTRT(1)
      GO TO 79
6     STRT(I)=FSTRT(I)-FSTRT(I-1)
79    DO 5 J=1.4
      TMO(I.J)=FTMO(I.J)
5     CONTINUE
74    CONTINUE
      WRITE(7.1000)
      WRITE(Z.1500) MMMM
      IF(NNNN.EQ.0) GO TO 7
      DO 8 MA=1.NNNN
      JBOND(MA)=1H
      IF(TMO(MA.1).GT.1.99) GO TO 9
      NNN=6
      IF(TMO(MA.3).GT.2.99) NNN=5
      IF((MA.EQ.1).A.(LLL.EQ.2)) NNN=1
      IF((MA.GT.1).A.(TMO(MA-1.1).GT.1.99)) NNN=1
      GO TO 10
9     NNN=7
10    CONTINUE
      IF(NNN.EQ.5) JBOND(MA)=1HU
      IF(NNN.EQ.6) JBOND(MA)=1HP
      IF((ITY.EQ.2).A.(JHEST.EQ.2).A.(MA.EQ.1))  JBOND(MA)=1H
      MMM=INT(CCCST(NNN,1,1)+.1)+2
      DO 11 KKK=2.MMM
      IF(TMO(MA.2).GE.CCCST(NNN.KKK,1)) GO TO 12
11    CONTINUE
12    CONTINUE
      ILINE(MA)=INT(CCCST(NNN.1.2)+.1)+KKK-2
      IYEAR(MA)=INT(STRT(MA)+.1)
8     INCHES(MA)=INT(TMO(MA.2)*100.+.001)
7     MA=NNNN+1
      ILINE(MA)=INT(CCCST(7.1.2)+.1)
      IF(NNNN.EQ.0) GO TO 153
      IYEAR(MA)=JDL+1-STRT(NNNN)
      GO TO 154
153   IYEAR(MA)=JDL+1
154   CONTINUE
      INCHES(MA)=400
      MA=1
      YEARCST=0.0
      WMAINT=0.0
      JTHICK=0.0
      SUMUSE=0.0
      WOVERLY=0.0
      YTOTAL=0.0
      WTOTAL=0.0
      MO=0
663   MO=MO+1
      MG=IYEAR(MO)
      DO 720 MF=1.MG
      IF(MO.GT.1) GO TO 13
      IF((LLL.EQ.1).AND.(IREST.GT.1)) GO TO 260
      IF((LLL.EQ.1).AND.(ID.EQ.1)) GO TO 260
      IF(LLL.EQ.1)III=NCOM+NSBB+NB+8
      IF(LLL.EQ.2)III=NCOM+NSBB+NB+11
      GO TO 261
  260 IF(IREST.EQ.2) III=NCOM+NSBB+NB+8
      IF(IREST.EQ.3) III=NCOM+NSBB+NB+11
      IF((ID.EQ.1).AND.(ITY.EQ.1)) III=NCOM+NSBB+NB+8
      IF((ID.EQ.1).AND.(ITY.EQ.2)) III=NCOM+NSBB+NB+11
  261 CONTINUE
      M3=INT(CCCST(III,1,2)+.1)
      GO TO 14
   13 LLQ=INT(TMO(MO-1,1)+.1)
      IF(LLQ.EQ.1) III=NCOM+NSBB+NB+9
      IF(LLQ.EQ.2) III=NCOM+NSBB+NB+12
      M3=INT(CCCST(III,1,2)+.1)
   14 CONTINUE
C
C     COMPUTE MAINTENANCE COSTS FOR THE YEAR
C
      DO 670 MH = L1,L2
      IF (LINE(MH).EQ.M3) GO TO 675
  670 CONTINUE
  675 MJ=MH+10
      DO 680  MI = MH,MJ
      IF(LIMITU(MI).GE.MF) GO TO 685
  680 CONTINUE
  685 XMAINT= FACTOR*(LLLAREA*(YINTER(MI)+(SLOPE(MI)*MF)))
      XMAINT=XMAINT+TATAL(NA)
      YEARCST=YEARCST+XMAINT
C
C     COMPUTE USER COSTS FOR THE YEAR
C
      LLQ=NCOM+NSBB+NB+10
      LLR=INT(CCCST(LLQ,1,1)+.1)
      IF(LLR.EQ.0) GO TO 29
      LLQ=INT(CCCST(LLQ,1,2)+.1)
      LLP=LLQ+10
      DO 15 I=LLQ,LLP
      IF(LIMITU(I).GE.MF) GO TO 16
   15 CONTINUE
   16 USECOST=FACTOR*(YINTER(I)+SLOPE(I)*MF)
   29 IF(LLR.EQ.0) USECOST=0.
      YEARCST=YEARCST+USECOST
      IF(IYEAR(MO).EQ.MF) GO TO 695
      INTHICK = 0
      IBSTHK=0
      OVERLAY = 0.0
      IFAR=3
      GO TO 712
  695 INTHICK=INT(FLOAT(INCHES(MO))/100.)
      IBOND=JBOND(MO)
      IBSTHK=INCHES(MO)-100*INTHICK
      INTHK=INTHICK-IBSTHK
      DO 700 MK = 1,K2
      IF(LINE(MK).EQ.ILINE(MO)) GO TO 710
  700 CONTINUE
  710 OVERLAY=FACTOR*(LLLAREA*(YINTER(MK)+SLOPE(MK)*INTHK))
      IF(IBSTHK.EQ.0) GO TO 225
      IOVBSE=NCOM+NSHB+NB+7
      IFIRST=INT(CCCST(IOVBSE,1,2)+.1)
      LAST=IFIRST+INT(CCCST(IOVBSE,1,1)+.1)-1
      DO 226 JOVBSE=IFIRST,LAST
      IF(LIMITU(JOVBSE).GT.IBSTHK) GO TO 227
  226 CONTINUE
  227 IOVBSE=JOVBSE
      BSOVER=FACTOR*(LLLAREA*(YINTER(IOVBSE)+SLOPE(IOVBSE)*IBSTHK))
      OVERLAY=OVERLAY+BSOVER
  225 CONTINUE
      IYP=INT(TMO(MO,1)+.1)
      IF(IYP.EQ.1) DLC=DLCR
      IF(IYP.EQ.2) DLC=DLCF
      IF(IYP.LE.2) IFAR=IYP
      IF(IYFAR(MO).NE.MF) IFAR=3
      OVERLAY=OVERLAY+DLC
      YEARCST=YEARCST+OVERLAY
  712 DSCOUNT=YEARCST/((1.0+XINTRS)**NA)
      IF(INTHICK.EQ.0) GO TO 155
      IF(IBOND.NE.1H ) GO TO 713
      IF(IBSTHK.EQ.0) WRITE(Z,1512) NA,XMAINT,INTHICK,IARF(IFAR),
     1OVERLAY,USECOST,YEARCST,DSCOUNT
      IF(IBSTHK.EQ.0) GO TO 156
      WRITE(Z,1510) NA,XMAINT,INTHICK,IARF(IFAR),IBSTHK,OVERLAY,USECOST,
     1YEARCST,DSCOUNT
      GO TO 156
  713 WRITE(Z,1511) NA,XMAINT,INTHICK,IARF(IFAR),IBOND,OVERLAY,USECOST,
     1YEARCST,DSCOUNT
      GO TO 156
  155 WRITE(Z,1710) NA,XMAINT,OVERLAY,USECOST,YEARCST,DSCOUNT
  156 CONTINUE
      WMAINT=WMAINT+XMAINT
      JTHICK=JTHICK+INTHICK
      WOVERLY=WOVERLY+OVERLAY
      SUMUSE=SUMUSE+USECOST
      WTOTAL=WTOTAL+YEARCST
      YTOTAL=YTOTAL+DSCOUNT
      IF(LLL.EQ.1) XTOTAL=YTOTAL
      YEARCST=0.0
      IF(NA.EQ.JDL) GO TO 490
      NA=NA+1
  720 CONTINUE
      GO TO 663
  490 CONTINUE
      WRITE(Z,1001)
      WRITE(Z,1520)WMAINT,JTHICK,WOVERLY,SUMUSE,WTOTAL,YTOTAL
      IF(ID.EQ.1) GO TO 157
      IF(IREST.EQ.2) WRITE(Z,1600)
      IF(IREST.EQ.3) WRITE(Z,1700)
  157 CONTINUE
      IF(IREST.GT.1) GO TO 222
      LPHS=1
      DO 230 LPDG=2,LPCT,2
      IF(MMMM.EQ.LPDG) LPHS=2
  230 CONTINUE
      IF(ID.EQ.1) GO TO 158
      IF(LPHS.EQ.1) WRITE(Z,1600)
      IF(LPHS.EQ.2) WRITE(Z.1700)
  158 CONTINUE
  222 CONTINUE
      WRITE(7.1721)
      IF(JCOND.EQ.2) WRITE(Z.1722)
  200 CONTINUE
  205 CONTINUE
      LPP=K4/NUMS
      IF(NCOM.EQ.0) LPP=MLYST*NB+1
      IF(IREST.EQ.3) LPP=LPP-1
      IF(IREST.EQ.2) LPP=1
      IF(ID.EQ.1) LPP=1
      DO 500 II=1.LPP
      IF(II.NE.1) READ(7) ICK
      MM=MM+1
      JC=JC+1
      MXX=MMMM-1
      IF(ID.EQ.1) GO TO 160
      IF(ICK.EQ.2) GO TO 160
      IF(IREST.EQ.3) GO TO 51
      IF((IREST.EQ.1).AND.(II.GT.1)) GO TO 51
C
C     WRITE HEADING FOR RIGID CONSTRUCTION SCHEME
C
      IF(IREST.EQ.2) MXX=MMMM
      WRITE(7.1000)
      IF(ID.NE.3) WRITE(Z.1401) MM.MXX
      IF(ID.EQ.3) WRITE(Z.1403) MM
      KB=2
      XTHICK(1)=TT
      XTHICK(2)=T1
      ITHICK(1)=INT(TT+.1)
      ITHICK(2)=INT(T1+.1)
      DO 17 I=1.KB
      IFIRST=INT(CCCST(I.1.2)+.1)
      LAST=IFIRST+INT(CCCST(I.1.1)+.1)-1
      DO 18 J=IFIRST.LAST
      IF(LIMITU(J).GT.ITHICK(I)) GO TO 19
   18 CONTINUE
   19 ITYPE(I)=J
   17 CONTINUE
      GO TO 152
   51 CONTINUE
C
C     WRITE HEADING FOR FLEXIBLE CONSTRUCTION SCHEMES
C
      WRITE(Z.1000)
      IF(ID.NE.3) WRITE(Z.1400) MM.MMMM
      IF(ID.EQ.3) WRITE(Z.1402) MM
      READ(7) NLYR.NQLYR.NKOM
      LLYR=NLYR+3
      IF(NCOM.EQ.0) LLYR=NLYR+2
      READ(7) (IX(IIL).IIL=1.NLYR).ICMP.IBASE
      READ(7) CDF.(TMT(IIL).IIL=1.LLYR)
      KB=NLYR+3
      JLYR=NLYR
      IF(NCOM.EQ.0) KB=KB-1
      DO 20 I=1.K8
      J=K8-I+1
      IF(I.GT.1) GO TO 21
      KK=3
      GO TO 23
 21   IF(I.GT.2) GO TO 22
      KK=NCOM+NSBB+NB+7
      GO TO 23
 22   IF((I.EQ.K8).AND.(NCOM.NE.0)) GO TO 24
      MLYR=NLYR-JLYR
      IF(MLYR.GE.NQLYR) KK=7+IX(JLYR)
      IF(MLYR.LT.NQLYR) KK=NKOM+7+IX(JLYR)
      JLYR=JLYR-1
      GO TO 23
 24   KK=ICMP+7
 23   CONTINUE
      XTHICK(I)=TMT(J)
      ITHICK(I)=INT(TMT(J)+.1)
      IFIRST=INT(CCCST(KK.1,2)+.1)
      LAST=IFIRST+INT(CCCST(KK.1,1)+.1)-1
      DO 26 K=IFIRST.LAST
      IF(LIMITU(K).GE.ITHICK(I)) GO TO 25
 26   CONTINUE
 25   ITYPE(I)=K
 20   CONTINUE
C     ESTABLISH DO LOOP TO COMPUTE AND WRITE OUTPUT FOR EACH LAYER
C
      SUMUNIT=0.
 152  SUMCOST=0.
      SUMSECT=0.
      KSTH=0
      NTH=0
      SUM=0.
      TICK=0.
      WRITE(7.1410)
      DO 300 MW=1.K8
C
C     COMPUTE COST PER SQ YARD AND TOTAL COST. FIND APPLICABLE COST PARAMETER
C
      DO 400 MX=1.K2
      IF(ITYPE(MW).EQ.LINE(MX)) GO TO 410
 400  CONTINUE
 410  UNITCST=FACTOR*(YINTER(MX)+XTHICK(MW)* SLOPE(MX))
      TOTCOST= UNITCST*IAREA
      SUM=SUM+XTHICK(MW)
      SUMUNIT=SUMUNIT+UNITCST
      SUMCOST=SUMCOST+TOTCOST
      WRITE(7.1420)MW.(DSCRPT(MY.MX).MY=1.3).XTHICK(MW).UNITCST.TOTCOST
      IF(DSCRPT(1.MX).EQ.10HFIRST COMP) NTH=1
      IF(DSCRPT(1.MX).EQ.10HSECOND COM) NTH=1
      IF(DSCRPT(1.MX).EQ.10HTHIRD COMP) NTH=1
      IF(DSCRPT(1.MX).EQ.10HFOURTH COM) NTH=1
      IF(DSCRPT(1.MX).EQ.10HFIFTH COMP) NTH=1
      IF(DSCRPT(1.MX).EQ.10HSIXTH COMP) NTH=1
      IF(DSCRPT(1.MX).EQ.10HSEVENTH CO) NTH=1
      IF(DSCRPT(1.MX).EQ.10HEIGHTH COM) NTH=1
      IF(DSCRPT(1.MX).EQ.10HNINETH COM) NTH=1
      IF(DSCRPT(1,MX).EQ.10HTENTH COMP) NTH=1
      IF(NTH.EQ.1) GO TO 600
      KSTH=KSTH+ITHICK(MW)
      TICK=TICK+XTHICK(MW)
  600 CONTINUE
  300 CONTINUE
      IF(EARTHWK.LT.0.5.OR.EARTHWK.GT.5.0)GO TO 601
      JACK=MM
      THCK=SUM
      CALL EXCOST6
      GO TO 603
  601 ERCOST=EARTHWK
  603 IF(DRAIN.LT.0.5.OR.DRAIN.GT.5.0)GO TO 602
      JACK=MM
      THCK=TICK
      CALL DRNAGE6(XTHICK(1))
      GO TO 604
  602 DRNCST=DRAIN
  604 SUMSECT=SUMSECT+SUMCOST
      ALLCNST=SUMSECT+ERCOST+DRNCST
  160 CONTINUE
      IF(ICK.NE.2) GO TO 350
      IZ=LPP*(MB-1)+II
      IY=IZ-LPP
      IZ2=IZ-1
      DO 351 IZ1=1,IZ2
      IF(IY.EQ.ISCHEME(IZ1)) IZ3=IZ1
  351 CONTINUE
      ALLCNST=SUMCNST(IZ3)
  350 CONTINUE
      IF(ID.EQ.1) ALLCNST=0.
      IF(ID.EQ.3) TOTAL=ALLCNST
      IF(ID.NE.3) TOTAL=ALLCNST+YTOTAL
      IF((ID.NE.3).AND.(II.EQ.1).AND.(IREST.LT.3)) TOTAL=ALLCNST+XTOTAL
C
C     WRITE TOTAL OF ALL CONSTRUCTION COSTS
C
      IF(ID.EQ.1) GO TO 161
      IF(ICK.EQ.2) GO TO 161
      WRITE(Z,1430)  SUM,SUMUNIT,SUMCOST
      WRITE(Z,1002)
      WRITE(Z,1002)
      WRITE(Z,1440)LLLAREA,SUMSECT;ERCOST,DRNCST,ALLCNST
  161 CONTINUE
      XA=ALLCNST
      IF(ID.EQ.3) MXB=0
      IF(ID.NE.3) MXB=MMMM
      IF((ID.NE.3).AND.(II.EQ.1).AND.(IREST.LT.3)) MXB=MXX
      MXC=MM
      IF(ID.EQ.3) XD=0.
      IF(ID.NE.3) XD=YTOTAL
      IF((ID.NE.3).AND.(II.EQ.1).AND.(IREST.LT.3)) XD=XTOTAL
      XE=TOTAL
      XF=WTOTAL
      DO 3010 JA=1,30
      IF( TOTAL.LT.SUMALL(JA)) GO TO 3015
 3010 CONTINUE
```

```
               GO TO 500
         3015  JD=JC
               IF(JD.GT.30)JD=30
               DO 3020 JB=JA,JD
               HOLDCST=SUMCNST(JB)
               SUMCNST(JB)=XA
               XA      =HOLDCST
               HOLDMNT=SUMAINT(JB)
               SUMAINT(JB)=XD
               XD     =HOLDMNT
               EEP=DSMAINT(JB)
               DSMAINT(JB)=XF
               XF=EEP
               HOLDSCM=ISCHEME(JB)
               ISCHEME(JB)=MXC
               MXC=HOLDSCM
               HOLDSTR=ISTRAGY(JB)
               ISTRAGY(JB)=MXB
               MXB=HOLDSTR
               HOLDALL=SUMALL(JB)
               SUMALL(JB)=XE
         3020  XE     =HOLDALL
          500  CONTINUE
          100  CONTINUE
          999  WRITE(7,1000)
               IF(ID.EQ.1) GO TO 162
               IF(IREST.EQ.1) GO TO 211
               IF((IREST.EQ.2).AND.(ID.EQ.2)) WRITE(Z,1570)
               IF((IREST.EQ.2).AND.(ID.EQ.3)) WRITE(Z,1580)
               WRITE(7,1800)
               IF((IREST.EQ.3).AND.(ID.EQ.2)) WRITE(Z,1550)
               IF((IREST.EQ.3).AND.(ID.EQ.3)) WRITE(Z,1585)
               IF(ID.EQ.2) WRITE(Z,1540)(ISCHEME(JF),ISTRAGY(JF),SUMCNST(JF),
              1SUMAINT(JF),SUMALL(JF),JF=1,JD)
               IF(ID.EQ.3) WRITE(Z,1590)(JF,ISCHEME(JF),SUMALL(JF),JF=1,JD)
               GO TO 220
          211  IF(ID.EQ.2) WRITE(Z,1570)
               IF(ID.EQ.3) WRITE(Z,1580)
               LLLAP=0
               DO 210 JF=1,JD
               IF(ID.EQ.3) GO TO 85
               LAP=1
               JJ=ISTRAGY(JF)
               DO 223 JJJ=2,LPCT,2
               IF(JJ.EQ.JJJ) LAP=2
          223  CONTINUE
               IF (LAP.EQ.2) GO TO 224
           85  IF((ID.EQ.3).A.(ISCHEME(JF).GT.1)) GO TO 224
               IF(ID.EQ.2) WRITE(Z,1540) ISCHEME(JF),ISTRAGY(JF),SUMCNST(JF),
              1SUMAINT(JF),SUMALL(JF)
               IF(ID.EQ.3) WRITE(Z,1590)JF,ISCHEME(JF),SUMALL(JF)
               GO TO 210
          224  LLLAP=LLLAP+1
               JCOMB(LLLAP)=JF
          210  CONTINUE
               WRITE(Z,1800)
               IF(ID.EQ.2) WRITE(Z,1550)
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      PROGRAM RL          74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE    16

                    IF(ID.EQ.3) WRITE(Z,1585)
                    DO 212 JT=1,LLLAP
                    JF=JCOMM(JT)
                    IF(ID.EQ.2) WRITE(Z,1540) ISCHEME(JF),ISTRAGY(JF),SUMCNST(JF),
   860             1SUMAINT(JF),SUMALL(JF)
                    IF(ID.EQ.3) WRITE(Z,1590) JF,ISCHEME(JF),SUMALL(JF)
               212  CONTINUE
                    GO TO 220
               162  WRITE(Z,1530)
   865              WRITE(Z,1720) (JF,ISTRAGY(JF),DSMAINT(JF),SUMALL(JF),JF=1,JD)
               220  CONTINUE
                    END


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

   104      I      69CD 108  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.
   110      I      29CD 115  FIELD WIDTH OF A CONVERSION DESCRIPTOR SHOULD BE AS LARGE AS THE MINIMUM SPECIFIED FOR THAT DESCRIPTOR.
   329      I                AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
   346      I                AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
   355      I                AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.


        SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     3  RL                2

 VARIABLES       SN  TYPE              RELOCATION
  7043  A            REAL                             REFS       277        356        358        360
   310  AESWL        REAL        ARRAY     WES        REFS        47
    36  AHH          REAL        ARRAY     HBLK       REFS        23
  7233  ALLCNST      REAL                             REFS       773        774        775        784        786
                                                   DEFINED       761        770        772
     0  AREA         REAL                  ARBK       REFS        16        341        431
     0  AXK          REAL                  LCY        REFS        24
  7172  RSOVER       REAL                             REFS       579    DEFINED        578
   334  CBR          REAL        ARRAY     WES        REFS        47        319
     0  CCCST        REAL        ARRAY     CSTBK      REFS        17      2*263      2*264        271        273        282        294
                                                         298       305      4*308      2*309        310        311        483        485
                                                         488       492        522        527        546        548        572        573
                                                         662       663        703        704
  7213  CDF        * REAL                          DEFINED       681
   717  CHAR         REAL        ARRAY     RL2        REFS        38        376        396        408
   310  COVRGO       REAL        ARRAY     MIXBLK     REFS        28
    14  CSTRT        REAL        ARRAY     RDSTR      REFS        34        339
     3  CUTPRCE      REAL                  TSV        REFS        45
  7174  DLC          REAL                             REFS       586    DEFINED        582        583
     0  DLCF         REAL                  CUSR       REFS        18        583
     1  DLCR         REAL                  CUSR       REFS        18        582
     1  DRAIN        REAL                  DRNBLK     REFS        21        266      2*754        759
     0  DRNCST       REAL                  DRNBLK     REFS        21        761        784    DEFINED        759
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          PROGRAM RL         74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE    17

VARIABLES     SN  TYPE           RELOCATION
 7175  DSCOUNT   REAL                             REFS      591      594      597      600      607
                                               DEFINED      588
  471  DSCRPT    REAL     ARRAY    RL2            REFS       38       63       65      376      391      392      396
                                                   408      732      733      734      735      736      737      738
                                                   739      740      741      742  DEFINED       65
10635  DSMAINT   REAL     ARRAY                   REFS       15      809      865  DEFINED      810
    3  DT        REAL              DOBK           REFS       20      441
 7126  DTOTAL    REAL                             REFS      446      457
    2  DT20      REAL              DOBK           REFS       20
    2  EARTHWK   REAL              RL1            REFS       37      266    2*748      753
 7254  EEP       REAL                             REFS      811  DEFINED      809
    1  ERCOST    REAL              TSV            REFS       45      761      784  DEFINED      753
    0  ESWL      REAL     ARRAY    WES            REFS       47
   26  FAC       REAL              LCY            REFS       24
    6  FACTOR    REAL              RL1            REFS       37      352      539      553      569      578      727
    4  FILPRCE   REAL              TSV            REFS       45
10050  FSTRT     REAL     ARRAY                   REFS        8      457      460    2*462  DEFINED      429
10144  FTMO      REAL     ARRAY                   REFS        9      457      464  DEFINED      429
    0  HH        REAL     ARRAY    HBLK           REFS       23
 7257  HOLDALL   REAL                             REFS      820  DEFINED      818
 7252  HOLDCST   REAL                             REFS      805  DEFINED      803
 7253  HOLDMNT   REAL                             REFS      808  DEFINED      806
 7255  HOLDSCM   REAL                             REFS      814  DEFINED      812
 7256  HOLDSTR   REAL                             REFS      817  DEFINED      815
 7024  I         INTEGER                          REFS       63     2*65      271      273      282      286    2*290
                                                   299      304      305      308    2*309      310      311    4*312
                                                 2*343    2*423    2*429      448    3*451    2*453      459    3*462
                                                 2*464      551    2*553      662      663      665      667      686
                                                   687      690      693      701      702      706      708
                                               DEFINED       62      270      281      289      342      423      429
                                                   447      458      550      661      685
 7121  IAREA     INTEGER                          REFS      432      728  DEFINED      431
10632  IARF      INTEGER  ARRAY                   REFS       14      591      594      597  DEFINED       50
 7212  IBASE   * INTEGER                       DEFINED      680
 7163  IBOND     INTEGER                          REFS      590      597  DEFINED      563
 7031  IBSTHK    INTEGER                          REFS      565      570      575      578      591      593      594
                                               DEFINED      259      558      564
    1  ICHR      INTEGER           MXBLK          REFS       29      318
 7114  ICK       INTEGER                          REFS      427      646      763      780  DEFINED      425      641
 7211  ICMP      INTEGER                          REFS      699  DEFINED      680
    0  ID        INTEGER           DOBK           REFS       20      329      346      355      379      417      418
                                                   422      424      428      433      435      441      442      443
                                                   444      513      519      520      617      626      639      645
                                                   654      655      675      676      772      773      774      775
                                                   779      787      788      789      791      792      793      824
                                                   826      827      829      830      831      833      835      836
                                                   839      846      847      849      855      856      859      861
    3  IDENT     INTEGER  ARRAY    RL1            REFS       37      352
    2  IDF       INTEGER           RODLOD         REFS       40
    0  IDR       INTEGER           RODLOD         REFS       40
   15  IDSCRPT   INTEGER  ARRAY    RL2            REFS       38      354
 7162  IFAR      INTEGER                          REFS      591      594      597  DEFINED      560      584      585
 7167  IFIRST    INTEGER                          REFS      573      574      663      664      704      705
                                               DEFINED      572      662      703
    0  IGINT     INTEGER           MXBLK          REFS       29
 7067  II        INTEGER                          REFS      354      641      648      764      775      789      793
                                               DEFINED      354      640
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         PROGRAM RL        74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE    18

VARIABLES     SN  TYPE           RELOCATION
 7146  III       INTEGER                         REFS       522       527   DEFINED       514       515       517       518
                                                  519       520       525       526
 7210  IIL       INTEGER                         REFS       680       681   DEFINED       680       681
 7072  IL        INTEGER                         REFS       366   DEFINED       366
10334  ILINE     INTEGER   ARRAY                 REFS        11       567   DEFINED       488       492
    0  IMANQ     INTEGER            RDSTR        REFS        34
  620  IMIX      INTEGER            MIXBLK       REFS        28       260
10346  INCHES    INTEGER   ARRAY                 REFS        11       562       564   DEFINED       490       498
    0  IND       INTEGER            TMPL         REFS        44
 7160  INTHICK   INTEGER                         REFS       564       565       589       591       594       597       603
                                              DEFINED       557       562
 7164  INTHK     INTEGER                         REFS       569   DEFINED       565
 7166  IOVRSE    INTEGER                         REFS       572       573     2*578   DEFINED       571       577
    0  IREST     INTEGER            RESTR        REFS        35       315       324       422       426       428       435
                                                2*438       439       440       443       444       512       517       518
                                                  618       619       621       637       638       647       648       652
                                                  775       789       793       825       826       827       829       830
10536  ISCHEME   INTEGER   ARRAY                 REFS        12       768       812       831       833       846       847
                                                  849       859       861   DEFINED       813
    0  ISKIP     INTEGER            PRVNT1       REFS        33
10574  ISTRAGY   INTEGER   ARRAY                 REFS        12       815       831       841       847       859       865
                                              DEFINED       816
 7766  ITHICK    INTEGER   ARRAY                 REFS         6       665       706       744   DEFINED       659       660
                                                  702
    1  ITY       INTEGER            DOBK         REFS        20       442       482       519       520
 7754  ITYPE     INTEGER   ARRAY                 REFS         6       725   DEFINED       667       708
    2  IVM       INTEGER            PRVNT1       REFS        33       382
10310  IX        INTEGER   ARRAY                 REFS        10       695       696   DEFINED       680
 7101  IXY       INTEGER                         REFS       393       395       403       446       457
                                              DEFINED       386       391       392       438       439       440
 7235  IY        INTEGER                         REFS       768   DEFINED       765
10360  IYEAR     INTEGER   ARRAY                 REFS        11       509       556       585   DEFINED       489       494
                                                  496
 7173  IYP       INTEGER                         REFS       582       583     2*584   DEFINED       581
 7234  IZ        INTEGER                         REFS       765       766   DEFINED       764
 7237  IZ1       INTEGER                         REFS     2*768   DEFINED       767
 7236  IZ2       INTEGER                         REFS       767   DEFINED       766
 7240  IZ3       INTEGER                         REFS       770   DEFINED       768
 7025  J         INTEGER                         REFS      2*65       273       286       287       293       295       423
                                                  429     2*453     2*464       665       667       701       702
                                              DEFINED        64       273       279       287       291       423       429
                                                  452       463       664       686
 7250  JA        INTEGER                         REFS       797       802   DEFINED       796
    3  JACK      INTEGER            TMPL         REFS        44   DEFINED       749       755
 7026  JB        INTEGER                         REFS        69       803       804       806       807       809       810
                                                  812       813       815       816       818       819
                                              DEFINED        68       802
10372  JBOND     INTEGER   ARRAY                 REFS        11       563   DEFINED       471       480       481       482
 7027  JC        INTEGER                         REFS       643       800   DEFINED        70       643
10000  JCOMB     INTEGER   ARRAY                 REFS         7       858   DEFINED       852
    0  JCOND     INTEGER            FLAG         REFS        22       632
 7251  JD        INTEGER                         REFS       801       802       831       833       838       865
                                              DEFINED       800       801
    0  JDL       INTEGER            SCAN3        REFS        41       356       358       360       368       494       496
                                                  610
 7260  JF        INTEGER                         REFS     5*831     3*833       841       846     5*847     3*849       852
                                                5*859     3*861     4*865   DEFINED       831       833       838       858
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           PROGRAM RL        74/74   OPT=0 ROUND=*/ TRACE           FTN 4.6+420        09/02/77  13.54.00        PAGE    19

VARIABLES     SN  TYPE            RELOCATION
                                                     865
    1 JISKIP    INTEGER               PRVNT1        REFS        33       380
 7263 JJ        INTEGER                             REFS       843   DEFINED       841
 7264 JJJ       INTEGER                             REFS       843   DEFINED       842
 7073 JK        INTEGER                             REFS       366   DEFINED       366
 7075 JL        INTEGER                             REFS       369   DEFINED       369
 7214 JLYR      INTEGER                             REFS       694       695       696       697   DEFINED       683       697
    0 JMANQ     INTEGER               MANLK         REFS        27
 7171 JOVRSE    INTEGER                             REFS       575       577   DEFINED       574
    1 JREST     INTEGER               RESTR         REFS        35       315       324       482
 7265 JT        INTEGER                             REFS       858   DEFINED       857
 7136 JTHICK    INTEGER                             REFS       603       616   DEFINED       502       603
    0 JTYPE     INTEGER    ARRAY      RLMN          REFS        36       366
 7062 J1        INTEGER                             REFS       338     2*339   DEFINED       337
 7064 J2        INTEGER                             REFS       339   DEFINED       339
 7056 J3        INTEGER                             REFS     2*319   DEFINED       318
 7060 J4        INTEGER                             REFS       323   DEFINED       323
 7057 J5        INTEGER                             REFS       319   DEFINED       319
 7055 J6        INTEGER                             REFS       317       322       326   DEFINED       317       322       326
 7063 J7        INTEGER                             REFS       339   DEFINED       338
 7061 J8        INTEGER                             REFS       327   DEFINED       327
 7041 K         INTEGER                             REFS       273       297       301     2*308       311       706       708
                                                 DEFINED       273       295       307       705
 7065 KA        INTEGER                             REFS       352     6*376       391       392     6*396       400
                                                 DEFINED       352       376       388
 7102 KAB       INTEGER                             REFS       390       393   DEFINED       387       390
 7066 KB        INTEGER                             REFS     2*352       376       396       408   DEFINED     2*352       376
                                                     396       408
 7076 KC        INTEGER                             REFS       376       396       408   DEFINED       376       396       408
 7215 KK        INTEGER                             REFS       703       704   DEFINED       688       691       695       696
                                                     699
 7132 KKK       INTEGER                             REFS       485       488   DEFINED       484
 7103 KKNT      INTEGER                             REFS       394       402   DEFINED       389       393
 7071 KLA       INTEGER                             REFS       366       371   DEFINED       364       365
 7222 KSTH      INTEGER                             REFS       744   DEFINED       715       744
 7032 K1        INTEGER                             REFS       364       365       369       371   DEFINED       260
 7033 K2        INTEGER                             REFS       262     2*263       264       265       267       268       376
                                                     566       724   DEFINED       261       263
 7034 K3        INTEGER                             REFS     2*264       265       268   DEFINED       262       264
    1 K4        INTEGER               RL1           REFS        37       256       258       635   DEFINED       252       253
                                                     254       255
 7107 K5        INTEGER                             REFS       421   DEFINED       417       418
    0 K7        INTEGER               RL1           REFS        37       258       354
 7203 K8        INTEGER                             REFS       661       684       685       686       693       720
                                                 DEFINED       656       682       684
 7046 L         INTEGER                             REFS       296   DEFINED       292       302
 7262 LAP       INTEGER                             REFS       845   DEFINED       840       843
 7170 LAST      INTEGER                             REFS       574       664       705   DEFINED       573       663       704
 7514 LIMITL    INTEGER    ARRAY                    REFS         3       312       376       396       408
                                                 DEFINED       310
 7576 LIMITU    INTEGER    ARRAY                    REFS         3       312       376       396       408       537       551
                                                     575       665       706   DEFINED       311
 7123 LIMU      INTEGER                             REFS       436   DEFINED       434       435
 7266 LINE      INTEGER    ARRAY                    REFS         3       533       567       725   DEFINED       290
 7124 LLL       INTEGER                             REFS       444       475       512       513       514       515       608
                                                 DEFINED       436
 7261 LLLAP     INTEGER                             REFS       851       852       857   DEFINED       837       851
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          PROGRAM RL          74/74    OPT=0 ROUND=*/ TRACE               FTN 4.6+420          09/02/77  13.54.00        PAGE    20

VARIABLES      SN  TYPE                 RELOCATION
   7122  LLLAREA      INTEGER                          REFS       539       569       578       784   DEFINED       432
   7156  LLP          INTEGER                          REFS       550   DEFINED       549
   7150  LLQ          INTEGER                          REFS       525       526       546       548       549       550
                                                    DEFINED       524       545       548
   7155  LLR          INTEGER                          REFS       547       554   DEFINED       546
   7207  LLYR         INTEGER                          REFS       681   DEFINED       678       679
      5  LOCATE       INTEGER    ARRAY   RL2           REFS        38       352
   7030  LPCT         INTEGER                          REFS       623       842   DEFINED       256
   7200  LPDG         INTEGER                          REFS       624   DEFINED       623
   7177  LPHS         INTEGER                          REFS       627       628   DEFINED       622       624
   7201  LPP          INTEGER                          REFS       637       640       764       765   DEFINED       635       636
                                                        637       638       639
     27  LS           INTEGER            LCY           REFS        24       317       319       322       323       326       327
      1  L7           INTEGER            RODLOD        REFS        40       363
   7035  L1           INTEGER                          REFS       388       532   DEFINED       267
   7660  L10          INTEGER    ARRAY                 REFS         3       293       297       301   DEFINED       286
   7051  L11          INTEGER                          REFS       298   DEFINED       297
   7047  L12          INTEGER                          REFS       294       304   DEFINED       293
   7077  L13       *  INTEGER                       DEFINED       384
   7104  L15          INTEGER                          REFS       405       407   DEFINED       400
   7106  L16          INTEGER                          REFS     6*408   DEFINED       407
   7105  L17          INTEGER                          REFS       407   DEFINED       405
   7100  L18          INTEGER                          REFS       399       400       405   DEFINED       385       399
   7036  L2           INTEGER                          REFS       289       388       532   DEFINED       268
   7040  L3           INTEGER                          REFS       272       273   DEFINED       271       272
   7052  L4           INTEGER                          REFS       299   DEFINED       298
   7037  L5           INTEGER                          REFS       270       280       281   DEFINED       269
   7050  L6           INTEGER                          REFS       304   DEFINED       294
   7044  L8           INTEGER                          REFS       284       291   DEFINED       280       284
   7045  L9           INTEGER                          REFS       283   DEFINED       282
   7053  M            INTEGER                          REFS       305     4*308     2*309       310       311
                                                    DEFINED       301       304
   7127  MA           INTEGER                          REFS       471       472       474       475     2*476       480       481
                                                      2*482       485       488     2*489     2*490       492       494       496
                                                        498   DEFINED       470       491
   7112  MB           INTEGER                          REFS       764   DEFINED       421
   7145  MF           INTEGER                          REFS       537       539       551       553       556       585
                                                    DEFINED       510
   7144  MG           INTEGER                          REFS       510   DEFINED       509
   7151  MH           INTEGER                          REFS       533       535       536   DEFINED       532
   7153  MI           INTEGER                          REFS       537     2*539   DEFINED       536
   7152  MJ           INTEGER                          REFS       536   DEFINED       535
   7165  MK           INTEGER                          REFS       567     2*569   DEFINED       566
   7216  MLYR         INTEGER                          REFS       695       696   DEFINED       694
      1  MLYST        INTEGER            MANLK         REFS        27       252       253       254       255       636
   7111  MM           INTEGER                          REFS       642       654       655       675       676       749       755
                                                        790   DEFINED       420       642
   7131  MMM          INTEGER                          REFS       484   DEFINED       483
   7110  MMMM         INTEGER                          REFS       437     2*439     2*440       446       457       468       624
                                                        644       652       675       788   DEFINED       419       437
   7143  MO           INTEGER                          REFS       508       509       511       524       556       562       563
                                                        564       567       581       585   DEFINED       507       508
   7226  MW           INTEGER                          REFS       725       727       729     2*732       744       745
                                                    DEFINED       720
   7227  MX           INTEGER                          REFS       725     2*727       732       733       734       735       736
                                                        737       738       739       740       741       742
                                                    DEFINED       724
          PROGRAM RL          74/74   OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00        PAGE     21

VARIABLES       SN  TYPE             RELOCATION
  7243  MXB        INTEGER                                 REFS       816   DEFINED      787        788        789        817
  7244  MXC        INTEGER                                 REFS       813   DEFINED      790        814
  7202  MXX        INTEGER                                 REFS       654       789   DEFINED        644        652
  7232  MY         INTEGER                                 REFS       732   DEFINED      732
  7147  M3         INTEGER                                 REFS       533   DEFINED      522        527
  7054  N          INTEGER                                 REFS       306       307      2*308      2*309        310
                                                        DEFINED       305       306
  7133  NA         INTEGER                                 REFS       540       588        591        594        597        600        610
                                                            611   DEFINED       499        611
     0  NAME       INTEGER      ARRAY    RL2               REFS        38       352
   243  NB         INTEGER               LYTD              REFS        25       252        253        254        255        261        269
                                                            342       514       515        517        518        519        520        525
                                                            526       545       571        636        691
    51  NCOM       INTEGER               LYTD              REFS        25       261        269        514        515        517        518
                                                            519       520       525        526        545        571        636        679
                                                            684       691       693
     5  NFRTH      INTEGER               TSV               REFS        45   DEFINED        249
  7120  NFSTRT     INTEGER                                 REFS       429       456        457    DEFINED        429
  7206  NKOM       INTEGER                                 REFS       696   DEFINED        677
  7074  NL         INTEGER                                 REFS     2*369   DEFINED        368
  7204  NLYR       INTEGER                                 REFS       678       679        680        682        683        694
                                                        DEFINED       677
     0  NLYST      INTEGER               NANLK             REFS        30       252        253        254        255
  7070  NN         INTEGER                                 REFS       354   DEFINED        354
     0  NNAT       INTEGER               LYTD              REFS        25
  7130  NNN        INTEGER                                 REFS       480       481        483        485        488
                                                        DEFINED       473       474        475        476        478
  7125  NNNN       INTEGER                                 REFS       447       458        469        470        491        493        494
                                                        DEFINED       445       456
    36  NOACFT     INTEGER      ARRAY    RLMN              REFS        36       369
     5  NOD        INTEGER               NBLK              REFS        31
     0  NOG        INTEGER               NBLK              REFS        31
     1  NOH        INTEGER               NBLK              REFS        31
     2  NOO        INTEGER      ARRAY    RDSTR             REFS        34       338
     6  NOSG       INTEGER               NBLK              REFS        31
     2  NPT        INTEGER               NBLK              REFS        31
  7205  NQLYR      INTEGER                                 REFS       695       696    DEFINED        677
  7113  NRSTRT     INTEGER                                 REFS       423       445        446    DEFINED        423
   146  NSBB       INTEGER               LYTD              REFS        25       261        269        514        515        517        518
                                                            519       520       525        526        545        571        691
  7223  NTH        INTEGER                                 REFS       743   DEFINED        716        733        734        735        736
                                                            737       738       739        740        741        742
     1  NUMS       INTEGER               RDSTR             REFS        34       252        253        254        255        337        417
                                                            635
     3  NX         INTEGER               NBLK              REFS        31
     4  NY         INTEGER               NBLK              REFS        31
  7161  OVERLAY    REAL                                    REFS       579       586        587        591        594        597        600
                                                            604   DEFINED       559        569        579        586
     2  PSTEP      REAL                  TSV               REFS        45
 10036  RSTRT      REAL         ARRAY                      REFS         8       446        449      2*451    DEFINED        423
 10074  RTMO       REAL         ARRAY                      REFS         9       446        453    DEFINED        423
  7432  SLOPE      REAL         ARRAY                      REFS         3       309        312        376        396        408        539
                                                            553       569       578        727    DEFINED        308
   144  STOREE     REAL         ARRAY    MIXBLK            REFS        28
     0  STORO      REAL         ARRAY    MIXBLK            REFS        28
 10062  STRT       REAL         ARRAY                      REFS         8       489        494    DEFINED        449        451        460
                                                            462
          PROGRAM RL          74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE     22

VARIABLES       SN  TYPE            RELOCATION
  7224  SUM         REAL                            REFS       729       750       781   DEFINED       717       729
 10442  SUMAINT     REAL     ARRAY                  REFS        12       806       831       847       859
                                                 DEFINED       807
 10500  SUMALL      REAL     ARRAY                  REFS        12       797       818       831       833       847       849
                                                     859       861       865   DEFINED        69       819
 10404  SUMCNST     REAL     ARRAY                  REFS        12       770       803       831       847       859
                                                 DEFINED       804
  7220  SUMCOST     REAL                            REFS       731       760       781   DEFINED       713       731
  7221  SUMSECT     REAL                            REFS       760       761       784   DEFINED       714       760
  7217  SUMUNIT     REAL                            REFS       730       781   DEFINED       712       730
  7137  SUMUSE      REAL                            REFS       605       616   DEFINED       503       605
  7117  SVCOST    * REAL                         DEFINED       427
     1  SWID        REAL              TMPL          REFS        44
     0  TATAL       REAL     ARRAY    TTL           REFS         5        46       540
     0  THCK        REAL              TSV           REFS        45   DEFINED       750       756
     0  THFF        REAL     ARRAY    THKBK         REFS        43       323
  7225  TICK        REAL                            REFS       745       756   DEFINED       718       745
    12  TM          REAL     ARRAY    HBLK          REFS        23       317       322       326
 10214  TMO         REAL     ARRAY                  REFS         9       472       474       476       485       490       524
                                                     581   DEFINED       453       464
 10264  TMT         REAL     ARRAY                  REFS        10       701       702   DEFINED       681
  7241  TOTAL       REAL                            REFS       794       797   DEFINED       773       774       775
  7231  TOTCOST     REAL                            REFS       731       732   DEFINED       728
    24  TRKK        REAL     ARRAY    THKBK         REFS        43
     0  TRPQ7       REAL     ARRAY    PQZ           REFS        32       327
     0  TRST        REAL              DMBLK         REFS        19       275
     2  TRY         REAL     ARRAY    LCY           REFS        24
  7115  TT          REAL                            REFS       446       457       657       659   DEFINED       427       441
     2  TWOCL       REAL              TMPL          REFS        44
  7116  TI          REAL                            REFS       658       660   DEFINED       427
  7230  UNITCST     REAL                            REFS       728       730       732   DEFINED       727
  7157  USECOST     REAL                            REFS       555       591       594       597       600       605
                                                 DEFINED       553       554
  7023  W           INTEGER                         REFS        49   DEFINED       250  I/O REFS       257       258       265
                                                     266       273       312
   322  WHEELS      REAL     ARRAY    WES           REFS        47
  7135  WMAINT      REAL                            REFS       602       616   DEFINED       501       602
  7140  WOVERLY     REAL                            REFS       604       616   DEFINED       504       604
  7142  WTOTAL      REAL                            REFS       606       616       795   DEFINED       506       606
  7242  XA          REAL                            REFS       804   DEFINED       786       805
    30  XCBR        REAL              LCY           REFS        24       323       341
  7245  XD          REAL                            REFS       807   DEFINED       791       792       793       808
  7246  XE          REAL                            REFS       819   DEFINED       794       820
  7247  XF          REAL                            REFS       810   DEFINED       795       811
     0  XFP         REAL     ARRAY    SGSWP2        REFS        42       319
  7042  XINTRS      REAL                            REFS       356       358       588   DEFINED       275
     7  XK          REAL              NBLK          REFS        31       327       341
  7154  XMAINT      REAL                            REFS       540       541       591       594       597       600       602
                                                 DEFINED       539       540
   147  XMT         REAL     ARRAY    LYTD          REFS        25
    31  XSTR        REAL              LCY           REFS        24       341
  7742  XTHICK      REAL     ARRAY                  REFS         5       727       729       732       745       757
                                                 DEFINED       657       658       701
  7176  XTOTAL      REAL                            REFS       775       793   DEFINED       608
     1  YCHR        REAL     ARRAY    LYTD          REFS        25
  7134  YEARCST     REAL                            REFS       541       555       587       588       591       594       597
                                                     600       606   DEFINED       500       541       555       587       609
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            PROGRAM RL        74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE    23

   VARIABLES      SN  TYPE             RELOCATION
    7350  YINTER      REAL        ARRAY                   REFS        3        312       376        396        408        539        553
                                                           569      578        727    DEFINED       309
       1  YK          REAL                   LCY          REFS       24
    7141  YTOTAL      REAL                                REFS      607        608       616        774        792
                                                       DEFINED      505        607
    7022  7           INTEGER                             REFS       48    DEFINED       251    I/O REFS       314        316        317
                                                           319      321        322       323        325        326        327        328
                                                           330      332        334       336        339        341        343        345
                                                           347      349        351       352        354        356        358        360
                                                           361      362        366       367        369        371        372        373
                                                           375      376        378       383        394        396        402        404
                                                           406      408        411       467        468        591        594        597
                                                           600      615        616       618        619        627        628        631
                                                           632      653        654       655        674        675        676        719
                                                           732      781        782       783        784        823        826        827
                                                           828      829        830       831        833        835        836        847
                                                           849      854        855       856        859        861        864        865
      52  ZCBR        REAL        ARRAY     LYTD          REFS       25
     244  ZMT         REAL        ARRAY     LYTD          REFS       25      2*343

   FILE NAMES         MODE
          TAPE7       UNFMT                             READS       423        425       427        429        641        677        680        681
                                                       MOTION       413
          VARIABLES USED AS FILE NAMES, SEE ABOVE

   EXTERNALS          TYPE    ARGS          REFERENCES
          DATE                 1              277
          DRNAGE6              1              757
          EXCOST6              0              751
          PREVEN2              7              446      457

   INLINE FUNCTIONS   TYPE    ARGS          DEF LINE  REFERENCES
          FLOAT       REAL     1  INTRIN                 562
          INT         INTEGER  1  INTRIN                 271      282        294       298        305        310        311        431
                                                          483      488        489       490        492        522        524        527
                                                          546      548        562       572        573        581        659        660
                                                          662      663        702       703        704

   STATEMENT LABELS              DEF LINE    REFERENCES
     234  1                        288        281      285
       0  2                        313        289
     304  3                        303        295      296      300
     277  4                        301        299
       0  5                        465        458      463
    1453  6                        462        459
    1623  7                        491        469
       0  8                        490        470
    1535  9                        478        472
    1537  10                       479        477
       0  11                       486        484
    1601  12                       487        485
    2001  13                       524        511
    2025  14                       528        523
       0  15                       552        550
    2121  16                       553        551
       0  17                       668        661
       0  18                       666        664
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         PROGRAM RL          74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420         09/02/77  13.54.00        PAGE     24

STATEMENT LABELS                DEF LINE   REFERENCES
  2636  19                        667       665
     0  20                        709       685
  2730  21                        690       687
  2740  22                        693       690
  2773  23                        700       689        692        698
  2770  24                        699       693
  3025  25                        708       706
     0  26                        707       705
   451  27                        324       315
   474  28                        328       324
  2127  29                        554       547
  1112  30                        401       388        398
  1103  31                        399       395
  1143  40                        412       379        382        403
  1010  41                        382       380
  1013  42                        383       381
     0  50                        344       342
  2645  51                        670       647        648
   227  60                        286       283
   641  61                        356       355
   645  62                        358       355
   651  63                        360       355
   654  64                        361       357        359
  1436  71                        456       442        443        444
     0  72                        454       447        452
  1414  73                        451       448
  1474  74                        466       455
  1420  78                        452       450
  1457  79                        463       461
     0  81                        320       318
  3720  85                        846       839
     0  100                       822       421
     0  150                        69        68
     0  151                       274       270
  3035  152                       713       669
  1643  153                       496       493
  1647  154                       497       495
  2351  155                       600       589
  2354  156                       601       593        596        599
  2435  157                       620       617
  2467  158                       629       626
  3263  160                       762       645        646
  3361  161                       785       779        780
  4040  162                       864       824
     0  200                       633       436
     0  201                       370       368
  1237  202                       424       422
  1253  203                       428       424        426
  1307  204                       430       428
  2502  205                       634       433
  3763  210                       853       838        850
  3657  211                       835       825
     0  212                       862       857
  4062  220                       866       834        863
     0  221                       410       407
  2470  222                       630       621
     0  223                       844       842
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              PROGRAM RL          74/74    OPT=0 ROUND=*/ TRACE             FTN 4.6+420          09/02/77  13.54.00        PAGE    25

STATEMENT LABELS                   DEF LINE   REFERENCES
 3755  224                           851        845       846
 2255  225                           580        570
    0  226                           576        574
 2240  227                           577        575
    0  230                           625        623
 1735  260                           517        512       513
 1773  261                           521        516
    0  300                           747        720
   24  301                            67         62        63
    0  302                            66         64
 3315  350                           771        763
    0  351                           769        767
    0  400                           726        724
 3066  410                           727        725
 2415  490                           614        610
 3536  500                           821        640       799
 3213  600                           746        743
 3232  601                           753        748
 3251  602                           759        754
 3235  603                           754        752
 3254  604                           760        758
 1574  663                           598        613
    0  670                           534        532
 2036  675                           535        533
    0  680                           538        536
 2052  685                           539        537
 2151  695                           562        556
    0  700                           568        566
 2201  710                           569        567
 2310  712                           598        561
 2342  713                           597        590
    0  720                           612        510
 4114  900       FMT                  74        273
 4116  901       FMT                  75        312
 4122  902       FMT                  76        257
 4126  910       FMT                  77        266
 4134  990       FMT                  78        258       265
    0  999              INACTIVE     823
 4135  1000      FMT                  79        314       328       345       362       373       383       404       467       653
                                                674       823
 4140  1001      FMT                  80        367       615
 4142  1002      FMT                  81        782       783
 4144  1005      FMT                  82        411
 4222  1010      FMT                  90        349
 4235  1011      FMT                  92        347
 4250  1012      FMT                  94        351
 4262  1013      FMT                  96        352
  604  1014                          347        346
  610  1015                          349        346
  614  1016                          351        346
  617  1017                          352        348       350
 4301  1020      FMT                  99        354
 4303  1030      FMT                 100        360
 4334  1031      FMT                 104        356
 4401  1032      FMT                 110        358
 4566  1033      FMT                 128        316
 4616  1035      FMT                 132        321
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          PROGRAM RL          74/74   OPT=0 ROUND=*/ TRACE              FTN 4.6+420          09/02/77  13.54.00        PAGE    26

STATEMENT LABELS                  DEF LINE    REFERENCES
 4634  1036     FMT                   134        325
 4652  1037     FMT                   136        317        322
 4661  1038     FMT                   137        319        323
 4665  1040     FMT                   138        326
 4677  1041     FMT                   140        327
 4703  1100     FMT                   141        366
 4712  1110     FMT                   143        369
 4715  1115     FMT                   144        371
 4730  1120     FMT                   146        372
 4751  1200     FMT                   149        375
 4774  1210     FMT                   152        376
 5004  1220     FMT                   154        378
 5044  1300     FMT                   159        394        406
 5067  1310     FMT                   162        396
 5076  1320     FMT                   164        402
 5156  1330     FMT                   172        408
 4447  1333     FMT                   116        361
 5165  1341     FMT                   174        330
 5174  1342     FMT                   175        334
 5202  1343     FMT                   176        332
 5211  1344     FMT                   177        336
 5225  1345     FMT                   179        339
 5231  1346     FMT                   180        341
  507  1351                           330        329
  513  1352                           332        329
  517  1353                           334        329
  523  1354                           336        331        333
    0  1360                           340        337
  554  1361                           341        335
 5255  1388     FMT                   183        343
 5273  1400     FMT                   185        675
 5306  1401     FMT                   187        654
 5321  1402     FMT                   189        676
 5330  1403     FMT                   190        655
 5337  1410     FMT                   191        719
 5351  1420     FMT                   194        732
 5356  1430     FMT                   195        781
 5365  1440     FMT                   196        784
 5412  1500     FMT                   201        468
 5436  1510     FMT                   204        594
 5447  1511     FMT                   206        597
 5460  1512     FMT                   208        591
 5467  1520     FMT                   210        616
 5501  1530     FMT                   212        864
 5526  1540     FMT                   216        831        847        859
 5533  1550     FMT                   217        829        855
 5566  1570     FMT                   222        826        835
 5621  1580     FMT                   227        827        836
 5641  1585     FMT                   230        830        856
 5661  1590     FMT                   233        833        849        861
 5665  1600     FMT                   234        618        627
 5675  1700     FMT                   236        619        628
 5706  1710     FMT                   238        600
 5714  1720     FMT                   239        865
 5720  1721     FMT                   240        631
 5751  1722     FMT                   244        632
 5777  1800     FMT                   248        828        854
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STATEMENT LABELS                DEF LINE   REFERENCES
  736  1999                        374       363
    0  3010                        798       796
 3443  3015                        800       797
    0  3020                        820       802

LOOPS  LABEL     INDEX       FROM-TO     LENGTH     PROPERTIES
    6  301     * I           62 67        21B                 NOT INNER
   14  302       J           64 66         7B      INSTACK
   31  150       JB          68 69         4B      INSTACK
  147  151     * I          270 274       34B                 EXT REFS  NOT INNER
  160          * J          273 273       16B                 EXT REFS  NOT INNER
  161          * K          273 273       12B                 EXT REFS
  215  1         I          281 288       22B         OPT
  241  2       * I          289 313      134B                 EXT REFS  NOT INNER
  260  3         K          295 303       27B         OPT
  416  81      * J3         318 320       14B                 EXT REFS
  527  1360    * J1         337 340       24B                 EXT REFS  NOT INNER
  535          * J2         339 339       11B                 EXT REFS
  560  50      * I          342 344       11B                 EXT REFS
  703  201     * NL         368 370       21B                 EXT REFS  NOT INNER
  706          * JL         369 369       11B                 EXT REFS
  743          * KA         376 376       31B                 EXT REFS  NOT INNER
  744          * KB         376 376       11B                 EXT REFS
 1027  30      * KA         388 401       66B                 EXT REFS
 1135  221     * L16        407 410       23B                 EXT REFS
 1203  100     * MB         421 822     2341B                 EXT REFS  NOT INNER
 1213          * I          423 423       21B                 EXT REFS  NOT INNER
 1220          * J          423 423       11B                 EXT REFS
 1263          * I          429 429       21B                 EXT REFS  NOT INNER
 1270          * J          429 429       11B                 EXT REFS
 1330  200     * LLL        436 633     1151B                 EXT REFS  NOT INNER
 1405  72      * I          447 454       27B                 NOT INNER
 1421  72        J          452 454       10B         OPT
 1444  5       * I          458 465       27B                 NOT INNER
 1460  5         J          463 465       10B         OPT
 1504  8       * MA         470 490      116B                 NOT INNER
 1570  11      * KKK        484 486       10B         OPT       EXITS
 1703  720     * MF         510 612      510B                 EXT REFS    EXITS   NOT INNER
 2027  670     * MH         532 534        6B      INSTACK      EXITS
 2042  680     * MI         536 538        7B      INSTACK      EXITS
 2111  15      * I          550 552        7B      INSTACK      EXITS
 2171  700     * MK         566 568        7B      INSTACK      EXITS
 2230  226     * JOVHSE     574 576        7B      INSTACK      EXITS
 2444  230       LPDG       623 625        7B      INSTACK
 2527  500     * II         640 821     1012B                 EXT REFS  NOT INNER
 2613  17      * I          661 668       30B                 NOT INNER
 2626  18      * J          664 666        7B      INSTACK      EXITS
 2716  20      * I          685 709      114B                 NOT INNER
 3015  26      * K          705 707        7B      INSTACK      EXITS
 3054  300     * MW         720 747      142B                 EXT REFS  NOT INNER
 3056  400     * MX         724 726        7B      INSTACK      EXITS
 3302  351       I71        767 769        7B      INSTACK
 3433  3010    * JA         796 798        6B      INSTACK      EXITS
 3452  3020      JB         802 820       63B         OPT
 3615          * JF         831 831       16B                 EXT REFS
 3642          * JF         833 833       11B                 EXT REFS
 3673  210     * JF         838 853       73B                 EXT REFS  NOT INNER
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          PROGRAM RL          74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00          PAGE     28

LOOPS  LABEL     INDEX        FROM-TO      LENGTH     PROPERTIES
 3705  223       JJJ          842 844         78       INSTACK
 4002  212     * JT           857 862        348                     EXT REFS
 4045          * JF           865 865        128                     EXT REFS

COMMON BLOCKS    LENGTH       MEMBERS - BIAS NAME(LENGTH)
       ARHK           1                     0 AREA     (1)
       CSTBK       1000                     0 CCCST    (1000)
       CUSR           2                     0 DLCF     (1)                1 DLCR     (1)
       DMBLK          1                     0 TRST     (1)
       DOBK           4                     0 ID       (1)                1 ITY      (1)                2 DT2Q     (1)
                                            3 DT       (1)
       DRNBLK         2                     0 DRNCST   (1)                1 DRAIN    (1)
       FLAG           1                     0 JCOND    (1)
       HBLK          40                     0 HH       (10)              10 TM       (20)              30 AHH      (10)
       LCY           26                     0 AXK      (1)                1 YK       (1)                2 THY      (20)
                                           22 FAC      (1)               23 LS       (1)               24 XCBR     (1)
                                           25 XSTR     (1)
       LYTD         176                     0 NNAT     (1)                1 YCBR     (40)              41 NCOM     (1)
                                           42 ZCBR     (60)             102 NSBB     (1)               103 XMT      (60)
                                          163 NB       (1)              164 ZMT      (12)
       MANLK          2                     0 JMANQ    (1)                1 MLYST    (1)
       MIXBLK       401                     0 STORO    (100)            100 STOREE   (100)            200 COVRGQ   (200)
                                          400 IMIX     (1)
       MXBLK          2                     0 IGINT    (1)                1 ICBR     (1)
       NANLK          1                     0 NLYST    (1)
       NBLK           8                     0 NOG      (1)                1 NOH      (1)                2 NPT      (1)
                                            3 NX       (1)                4 NY       (1)                5 NOD      (1)
                                            6 NOSG     (1)                7 XK       (1)
       POZ           20                     0 TRPOZ    (20)
       PRVNT1         3                     0 ISKIP    (1)                1 JISKIP   (1)                2 IVM      (1)
       RDSTR         72                     0 IMANQ    (1)                1 NUMS     (1)                2 NOO      (10)
                                           12 CSTRT    (60)
       RESTR          2                     0 IREST    (1)                1 JREST    (1)
       RLMN         530                     0 JTYPE    (30)              30 NOACFT   (500)
       RL1            7                     0 K7       (1)                1 K4       (1)                2 EARTHWK(1)
                                            3 IDENT    (3)                6 FACTOR   (1)
       RL2          813                     0 NAME     (5)                5 LOCATE   (8)               13 IDSCRPT(300)
                                          313 DSCRPT   (150)            463 CHAR     (350)
       RODLOD         3                     0 IDR      (1)                1 LZ       (1)                2 IDF      (1)
       SCAN3          1                     0 JDL      (1)
       SGSWP2       200                     0 XFP      (200)
       THKBK         40                     0 THFF     (20)              20 TRKK     (20)
       TMPL           4                     0 IND      (1)                1 SWID     (1)                2 TWOCL    (1)
                                            3 JACK     (1)
       TSV            6                     0 THCK     (1)                1 ERCOST   (1)                2 PSTEP    (1)
                                            3 CUTPRCE(1)                 4 FILPRCE(1)                 5 NERTH    (1)
       TTL           35                     0 TATAL    (35)
       WES          240                     0 ESWL     (200)            200 AESWL    (10)             210 WHEELS   (10)
                                          220 CBR      (20)

STATISTICS
  PROGRAM LENGTH                10673B     4539
  CM LABELED COMMON LENGTH       7073B     3643
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SUBROUTINE EXCOST6    74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE      1

                 SUBROUTINE EXCOST6
                 DIMENSION SAVER(50,2)
                 COMMON /TMPL/ IND,SWID,TWOCL,JACK
                 COMMON /TSV/THCK,ERCOST,PSTEP,FILPRCE,CUTPRCE,NERTH
                 COMMON /ZONES/ZONSTEP(9),APWID(9),APRSTR(9,3),APREND(9,3),NAPR,APT
                1OT
                 IF (NERTH.EQ.0) GO TO 2
                 IF (NERTH.GT.50) GO TO 2
                 DO 50 IK=1,NERTH
              50 IF (ABS(SAVER(IK,1)-THCK).LT.0.1) GO TO 55
                 GO TO 2
              55 ERCOST=SAVER(IK,2)
                 GO TO 99
               2 CUT=CUTCST=FILL=FILCST=0.0
                 I=0
                 REWIND 2
         1       B=A
                 READ(2) A
                 IFL=EOF(2)
                 IF(IFL.NE.0)GO TO 10
                 I=I+1
                 A=A-SWID*THCK/36
                 IF(I.EQ.1)GO TO 1
                 VOL=0.5*(A+B)*PSTEP/3
                 IF(VOL.GT.0.0)FILL=FILL+VOL
                 IF(VOL.LT.0.0)CUT=CUT+VOL
                 GO TO 1
         10      CUT=ABS(CUT)
                 CUTCST=CUT*CUTPRCE
                 FILCST=FILL*FILPRCE
                 ERCOST=CUTCST+FILCST+APTOT
                 NERTH=NERTH+1
                 SAVER(NERTH,1)=THCK
                 SAVER(NERTH,2)=ERCOST
                 WRITE(4,100)JACK,THCK
        100      FORMAT("1"5X*DESIGN SCHEME *I2,20X*THICKNESS OF *F5.2* INCHES*//)
                 WRITE(4,200)CUTPRCE,CUT,CUTCST,FILPRCE,FILL,FILCST,APTOT,ERCOST
        200      FORMAT(5X,*THE ESTIMATED COST PER CUBIC YARD OF CUT IS $*,F7.3,13X
                1,*THE NET VOLUME OF CUT IS *,F10.0,* CUBIC YARDS*//35X,*THE ESTIMA
                2TED COST OF CUT IS $*,F13.2//5X,*THE ESTIMATED COST PER CUBIC YARD
                3 OF FILL IS $*,F7.3,12X,*THE NET VOLUME OF FILL IS *,F10.0,* CUBIC
                4 YARDS*//35X,*THE ESTIMATED COST OF FILL IS $*,F13.2//5X,"THE TOTA
                5L COST FOR APPROACH ZONES IS $",F13.2//35X,"THE TOTAL COST OF EART
                6HWORK IS ESTIMATED AT $",F13.2)
              99 CONTINUE
                 RETURN
                 END


SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE      REFERENCES
   2  EXCOST6         1            46
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       SUBROUTINE EXCOST6     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420          09/02/77  13.54.00        PAGE      2

VARIABLES     SN  TYPE           RELOCATION
  262  A         REAL                                  REFS        17        22        24   DEFINED        18        22
   55  APREND    REAL       ARRAY    ZONES        REFS         5
   22  APRSTR    REAL       ARRAY    ZONES        REFS         5
  111  APTOT     REAL                ZONES        REFS         5        31        37
   11  APWID     REAL       ARRAY    ZONES        REFS         5
  261  B         REAL                                  REFS        24   DEFINED        17
  254  CUT       REAL                                  REFS        26        28        29        37   DEFINED        14        26
                                                    28
  255  CUTCST    REAL                                  REFS        31        37   DEFINED        14        29
    4  CUTPRCE   REAL                TSV          REFS         4        29        37
    1  ERCOST    REAL                TSV          REFS         4        34        37   DEFINED        12        31
  257  FILCST    REAL                                  REFS        31        37  DEFINED.        14        30
  256  FILL      REAL                                  REFS        25        30        37   DEFINED        14        25
    3  FILPRCE   REAL                TSV          REFS         4        30        37
  260  I         INTEGER                               REFS        21        23   DEFINED        15        21
  263  IFL       INTEGER                               REFS        20   DEFINED        19
  253  IK        INTEGER                               REFS        10        12   DEFINED         9
    0  IND       INTEGER             TMPL         REFS         3
    3  JACK      INTEGER             TMPL         REFS         3        35
  110  NAPR      INTEGER             ZONES        REFS         5
    5  NERTH     INTEGER             TSV          REFS         4         7         8         9        32        33        34
                                               DEFINED        32
    2  PSTEP     REAL                TSV          REFS         4        24
  265  SAVER     REAL       ARRAY                 REFS         2        10        12   DEFINED        33        34
    1  SWID      REAL                TMPL         REFS         3        22
    0  THCK      REAL                TSV          REFS         4        10        22        33        35
    2  TWOCL     REAL                TMPL         REFS         3
  264  VOL       REAL                                  REFS      2*25      2*26   DEFINED        24
    0  ZONSTEP   REAL       ARRAY    ZONES        REFS         5

FILE NAMES        MODE
       TAPE2     UNFMT                  READS        18    MOTION        16
       TAPE4     FMT                   WRITES        35        37

EXTERNALS          TYPE   ARGS       REFERENCES
       EOF       REAL       1            19

INLINE FUNCTIONS   TYPE   ARGS       DEF LINE  REFERENCES
       ABS       REAL       1  INTRIN              10          28

STATEMENT LABELS             DEF LINE   REFERENCES
   40  1                          17         23        27
   30  2                          14          7         8        11
  101  10                         28         20
    0  50                         10          9
   24  55                         12         10
  132  99                         45         13
  147  100     FMT                36         35
  172  200     FMT                38         37

LOOPS  LABEL    INDEX     FROM-TO    LENGTH     PROPERTIES
   12  50     * IK           9 10       108        OPT      EXITS

COMMON BLOCKS     LENGTH    MEMBERS - BIAS NAME(LENGTH)
       TMPL          4              0 IND     (1)                1 SWID   (1)                 2 TWOCL  (1)
                                    3 JACK    (1)
       SUBROUTINE EXCOST6    74/74   OPT=0 ROUND=*/ TRACE             FTN 4.6+420        09/02/77  13.54.00        PAGE     3

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       TSV           6                 0 THCK    (1)                  1 ERCOST (1)                 2 PSTEP  (1)
                                       3 FILPRCE(1)                   4 CUTPRCE(1)                 5 NERTH  (1)
       ZONES        74                 0 ZONSTEP(9)                   9 APWID  (9)                18 APRSTR (27)
                                      45 APREND (27)                 72 NAPR   (1)                73 APTOT  (1)

STATISTICS
  PROGRAM LENGTH                   431B      281
  CM LABELED COMMON LENGTH         124B       84
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      SUBROUTINE DRNAGE6 (TTHICK)
      COMMON/AKBLK/AKEF(10),PAVT,BIG,TBS,AKY
      COMMON/BSBLK/IBTE,FDE,BTE,GBM
      COMMON/BSBLK2/FDEF
      COMMON/DRNBLK/DRNCST,DRAIN
      COMMON /DRNBLK2/IDGWTO,IDIPO,EPO,DLO,PERMO,H30,LENGTHO,CAVCSTO,
     1FILCSTO,PIPCSTO,SLO,RNO,NOUTO,LOUTO
      COMMON /SA/ALOS,WOS
      COMMON /TSV/THCK,ERCOST,PSTEP,CUTPRCE,FILPRCE,NERTH
      COMMON/TMPL/ IND,SWID,TWOCL,JACK
      DRNCST=0.0
      H2F=0.0
      H2WT=0.0
      KDFLAG=0
      KD=0
      DGWT=FLOAT(IDGWTO)
      DIP=FLOAT(IDIPO)
      EP=EPO
      DL=DLO
      PERM=PERMO
      TBAS=THCK-TTHICK
      H3=H30+TBAS
      IF(LENGTHO.EQ.0)LENGTHO=IFIX(ALOS+.001)
      LENGTH=LENGTHO
      CAVCST=CAVCSTO
      FILCST=FILCSTO
      PIPECST=PIPCSTO
      SL=SLO
      RN=RNO
      NOUT=NOUTO
      LOUT=LOUTO
      IF((IBTE.EQ.5).OR.(IBTE.EQ.6))FDE=FDEF
      T=THCK
      IF(DRAIN.EQ.2) KDFLAG=2
      IF(T.LT.FDE)GO TO 20
1     IF(T+12.0.GE.DGWT)GO TO 30
4     IF(H2F.GT.0.0.OR.H2WT.GT.0.0)GO TO 10
2     IF(KDFLAG.GT.0)GO TO 40
      KDFLAG=1
      DRNCST=0.0
      WRITE(6,1500)
1500  FORMAT("  DRNAGE6- NO DRAINAGE REQUIRED")
      WRITE(12,2000)  JACK,DRNCST
2000  FORMAT(T6,I2,T12,"NO DRAINAGE REQUIRED",T92,1H$,F9.2)
      RETURN
20    H2F=FDE+6.0-T
      IF(H2F.LT.12.0)H2F=12.0
      GO TO 1
30    H2WT=12.0
      GO TO 4
40    DTP=DIP
      KD=1
      IF(DTP.GE.(T+12.0))GO TO 50
      DTP=T+12.0
      GO TO 50
11    DTPT=H2WT+T
      KD=4
      GO TO 12
13    DTP=DIP
      GO TO 50
10    IF(H2WT.GT.H2F)GO TO 11
      DTPT=H2F+T
      KD=3
12    IF(KDFLAG.GT.0)GO TO
      DTP=DTPT
      KDFLAG=KD
  50 TIME=(12*EP*DL**2)/(2880*PERM*H3)
      IF(TIME.GT.10.0)GO TO 51
      FCTR=2.0
      GO TO 52
51    DL=DL/2
      H3=TBAS+0.5*(H3-TBAS)
      FCTR=4.0
  52 Q=(PERM*TBAS*H3)/(60*DL*144)
      R=((257.*Q*RN)/SL**.5)**.375
      IF(R.LT.3.0)R=3.0
      GO TO (60.61.62).NOUT+1
61    NOUT=AINT(( LENGTH+500)/1000.+1)
      SLENGTH=DL*2*NOUT
      IF(FCTR.EQ.4.)SLENGTH=SLENGTH*2
      GO TO 60
62    NOUT=AINT(( LENGTH+500)/1000.+1)
      SLENGTH=DL*NOUT
      IF(FCTR.EQ.2.)SLENGTH=0
60    EXCAV=(DTP-T+6.0+R)*(12.+2*R)*LENGTH*12
      FILTER=EXCAV-(3.14159*R**2.)*LENGTH*12
      EXCAV=EXCAV/46656
      FILTER=FILTER/46656
      EXCVCST=EXCAV*CAVCST
      FMCST=FILTER*FILCST
      PIPCST=LENGTH*PIPECST
      CSTLF=(EXCVCST+FMCST+PIPCST)/LENGTH
      DRNCST=CSTLF*(FCTR*(LENGTH+NOUT*LOUT)+SLENGTH)
      WRITE(6,1000)T,FDE,H2F,DGWT,H2WT,DTP,TIME,FCTR,Q,R,DL,NOUT,DRNCST
1000 FORMAT( " DRNAGE6-- T,FDE,H2F,DGWT,H2WT,DTP,TIME,FCTR,Q,R,DL,NOUT,
    1DRNCST"/2X,6(F5.1,2X),F6.3,2X,F2.0,2X,F7.3,2X,3(F6.1,2X),F10.2)
      IF(KDFLAG.EQ.2)GO TO 70
      IF(KDFLAG.EQ.3)GO TO 81
      IF(KDFLAG.EQ.4)GO TO 82
      DRNCST=0.0
      WRITE(12,5000)JACK,DRNCST
5000 FORMAT(T6,I2,T12,"BAD KDFLAG CODE"T92,1H$,F9.2)
      RETURN
81    WRITE(12,3000)JACK,DTP,2*R,NOUT,FCTR,CSTLF,DRNCST
3000 FORMAT(T6,I2,T12,"FROST CONTROLS",T40,F5.2,T53,F4.1,T64,I2,T73,
    1F3.0,T82,1H$,F5.2,T92,1H$,F9.2)
      RETURN
82    WRITE(12,4000)JACK,DTP,2*R,NOUT,FCTR,CSTLF,DRNCST
4000 FORMAT(T6,I2,T12,"WATER TABLE CONTROLS",T40,F5.2,T53,F4.1,T64,I2,
    1T73,F3.0,T82,1H$,F5.2,T92,1H$,F9.2)
      RETURN
70    IF(KD.EQ.1)GO TO 71
      IF(KD.EQ.3)GO TO 72
      IF(KD.EQ.4)GO TO 73
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   SUBROUTINE DRNAGE6    74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00       PAGE     3

115                    DRNCST=0.0
                       WRITE(12,9000)JACK,DRNCST
                  9000 FORMAT(T6,I2,T12,"BAD KD CODE"T92,1H$,F9.2)
                       RETURN
                  71   WRITE(12,6000)JACK,DTP,2*R,NOUT,FCTR,CSTLF,DRNCST
120               6000 FORMAT(T6,I2,T12,"USER HAS SET DEPTH",T40,F5.2,T53,F4.1,T64,I2,
                      1T73,F3.0,T82,1H$,F5.2,T92,1H$,F9.2,T104,"DRAINAGE NOT REQUIRED")
                       RETURN
                  72   WRITE(12,7000)JACK,DTP,2*R,NOUT,FCTR,CSTLF,DRNCST
                  7000 FORMAT(T6,I2,T12,"USER HAS SET DEPTH",T40,F5.2,T53,F4.1,T64,I2,
125                   1T73,F3.0,T82,1H$,F5.2,T92,1H$,F9.2,T104,"FROST SHOULD CONTROL")
                       RETURN
                  73   WRITE(12,8000)JACK,DTP,2*R,NOUT,FCTR,CSTLF,DRNCST
                  8000 FORMAT(T6,I2,T12,"USER HAS SET DEPTH",T40,F5.2,T53,F4.1,T64,I2,
                      1T73,F3.0,T82,1H$,F5.2,T92,1H$,F9.2,T104,"WATERTABLE SHOULD CONTROL
130                   2")
                       RETURN
                       END


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

    77     I                 AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.



     SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    4  DRNAGE6        1        45       103       107       111       118       122       126       131

VARIABLES      SN  TYPE              RELOCATION
    0  AKEF        REAL      ARRAY   AKBLK      REFS        2
   15  AKY         REAL              AKBLK      REFS        2
    0  ALOS        REAL              SA         REFS        8        23
   13  BIG         REAL              AKBLK      REFS        2
    2  BTE         REAL              BSBLK      REFS        3
 1022  CAVCST      REAL                         REFS       89   DEFINED        25
    7  CAVCSTO     REAL              DRNBLK2    REFS        6        25
 1046  CSTLF       REAL                         REFS       93       104       108       119       123       127
                                             DEFINED       92
    3  CUTPRCE     REAL              TSV        REFS        9
 1012  DGWT        REAL                         REFS       36        94   DEFINED        16
 1013  DIP         REAL                         REFS       51        59   DEFINED        17
 1015  DL          REAL                         REFS       67        71        74        79        83        94
                                             DEFINED       19        71
    3  DLO         REAL              DRNBLK2    REFS        6        19
    1  DRAIN       REAL              DRNBLK     REFS        5        34
    0  DRNCST      REAL              DRNBLK     REFS        5        43        94       101       104       108       116
                                                 119      123       127   DEFINED        11        40        93       100
                                                 115
 1032  DTP         REAL                         REFS       53        85        94       104       108       119       123
                                                 127  DEFINED        51        54        59        65
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      SUBROUTINE DRNAGE6    74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

VARIABLES     SN  TYPE             RELOCATION
 1033 DTPT      REAL                           REFS        65   DEFINED        56        62
 1014 EP        REAL                           REFS        67   DEFINED        18
    2 EPO       REAL             DRNBLK2       REFS         6        18
    1 ERCOST    REAL             TSV           REFS         9
 1041 EXCAV     REAL                           REFS        86        87        89   DEFINED        85        87
 1043 EXCVCST   REAL                           REFS        92   DEFINED        89
 1035 FCTR      REAL                           REFS        80        84        93        94       104       108       119
                                                123       127   DEFINED        69        73
    1 FDE       REAL             BSBLK         REFS         3        35        46        94   DEFINED        32
    0 FDEF      REAL             BSBLK2        REFS         4        32
 1023 FILCST    REAL                           REFS        90   DEFINED        26
   10 FILCSTO   REAL             DRNBLK2       REFS         6        26
    4 FILPRCE   REAL             TSV           REFS         9
 1042 FILTER    REAL                           REFS        88        90   DEFINED        86        88
 1044 FMCST     REAL                           REFS        92   DEFINED        90
    3 GBM       REAL             BSBLK         REFS         3
 1006 H2F       REAL                           REFS        37        47        61        62        94
                                            DEFINED        12        46        47
 1007 H2WT      REAL                           REFS        37        56        61        94   DEFINED        13        49
 1020 H3        REAL                           REFS        67        72        74   DEFINED        22        72
    5 H30       REAL             DRNBLK2       REFS         6        22
    0 IBTE      INTEGER          BSBLK         REFS         3      2*32
    0 IDGWTO    INTEGER          DRNBLK2       REFS         6        16
    1 IDIPO     INTEGER          DRNBLK2       REFS         6        17
    0 IND       INTEGER          TMPL          REFS        10
    3 JACK      INTEGER          TMPL          REFS        10        43       101       104       108       116       119
                                                123       127
 1011 KD        INTEGER                        REFS        66       112       113       114   DEFINED        15        52
                                                 57        63
 1010 KDFLAG    INTEGER                        REFS        38        64        97        98        99
                                            DEFINED        14        34        39        66
 1021 LENGTH    INTEGER                        REFS        78        82        85        86        91        92        93
                                            DEFINED        24
    6 LENGTHO   INTEGER          DRNBLK2       REFS         6        23        24   DEFINED        23
 1030 LOUT      INTEGER                        REFS        93   DEFINED        31
   15 LOUTO     INTEGER          DRNBLK2       REFS         6        31
    5 NERTH     INTEGER          TSV           REFS         9
 1027 NOUT      INTEGER                        REFS        77        79        83        93        94       104       108
                                                119       123       127   DEFINED        30        78        82
   14 NOUTO     INTEGER          DRNBLK2       REFS         6        30
   12 PAVT      REAL             AKBLK         REFS         2
 1016 PERM      REAL                           REFS        67        74   DEFINED        20
    4 PERMO     REAL             DRNBLK2       REFS         6        20
 1045 PIPCST    REAL                           REFS        92   DEFINED        91
   11 PIPCSTO   REAL             DRNBLK2       REFS         6        27
 1024 PIPECST   REAL                           REFS        91   DEFINED        27
    2 PSTEP     REAL             TSV           REFS         9
 1036 Q         REAL                           REFS        75        94   DEFINED        74
 1037 R         REAL                           REFS        76      2*85        86        94       104       108       119
                                                123       127   DEFINED        75        76
 1026 RN        REAL                           REFS        75   DEFINED        29
   13 RNO       REAL             DRNBLK2       REFS         6        29
 1025 SL        REAL                           REFS        75   DEFINED        28
 1040 SLENGTH   REAL                           REFS        80        93   DEFINED        79        80        83        84
   12 SLO       REAL             DRNBLK2       REFS         6        28
    1 SWID      REAL             TMPL          REFS        10
 1031 T         REAL                           REFS        35        36        46        53        54        56        62
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        SUBROUTINE DRNAGE6    74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+420         09/02/77  13.54.00        PAGE     5

VARIABLES       SN  TYPE             RELOCATION
                                                       85       94   DEFINED       33
  1017  TRAS        REAL                             REFS       22      2*72       74   DEFINED       21
    14  TBS         REAL                 AKBLK       REFS        2
     0  THCK        REAL                 TSV         REFS        9        21       33
  1034  TIME        REAL                             REFS       68        94  DEFINED        67
     0  TTHICK      REAL                  F.P.       REFS       21   DEFINED        1
     2  TWOCL       REAL                 TMPL        REFS       10
     1  WOS         REAL                 SA          REFS        8

FILE NAMES          MODE
        TAPE12      FMT                         WRITES      43      101       104       108       116       119       123       127
        TAPE6       FMT                         WRITES      41       94

INLINE FUNCTIONS    TYPE    ARGS           DEF LINE  REFERENCES
        AINT        REAL       1  INTRIN                 78       82
        FLOAT       REAL       1  INTRIN                 16       17
        IFIX        INTEGER    1  INTRIN                 23

STATEMENT LABELS                    DEF LINE    REFERENCES
   104  1                              36          48
     0  2              INACTIVE        38
   110  4                              37          50
   172  10                             61          37
   160  11                             56          61
   202  12                             64          58
   166  13                             59          64
   127  20                             46          35
   137  30                             49          36
   143  40                             51          38
   211  50                             67          53         55        60
   225  51                             71          68
   236  52                             74          70
   326  60                             85          77         81
   270  61                             78          77
   310  62                             82          77
   431  70                            112          97
   447  71                            119         112
   455  72                            123         113
   463  73                            127         114
   415  81                            104          98
   423  82                            108          99
   542  1000      FMT                  95          94
   502  1500      FMT                  42          41
   514  2000      FMT                  44          43
   604  3000      FMT                 105         104
   630  4000      FMT                 109         108
   564  5000      FMT                 102         101
   667  6000      FMT                 120         119
   717  7000      FMT                 124         123
   747  8000      FMT                 128         127
   650  9000      FMT                 117         116

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
        AKBLK       14                 0 AKEF    (10)          10 PAVT    (1)              11 BIG     (1)
                                      12 TBS     (1)           13 AKY     (1)
        BSBLK        4                 0 IBTE    (1)            1 FDE     (1)               2 BTE     (1)
                                       3 GBM     (1)
     SUBROUTINE DRNAGE6     74/74    OPT=0 ROUND=*/ TRACE          FTN 4.6+420        09/02/77  13.54.00        PAGE     6

COMMON BLOCKS   LENGTH      MEMBERS - BIAS NAME(LENGTH)
       BSHLK2        1                0 FDEF     (1)
       DRNBLK        2                0 DRNCST   (1)           1 DRAIN    (1)
       DRNBLK2      14                0 IDGWTO   (1)           1 IDIPO    (1)          2 EPO      (1)
                                      3 DLO      (1)           4 PERMO    (1)          5 H30      (1)
                                      6 LENGTHO(1)             7 CAVCSTO(1)            8 FILCSTO(1)
                                      9 PIPCSTO(1)            10 SLO      (1)         11 RNO      (1)
                                     12 NOUTO    (1)          13 LOUTO    (1)
       SA            2                0 ALOS     (1)           1 WOS      (1)
       TSV           6                0 THCK     (1)           1 ERCOST   (1)          2 PSTEP    (1)
                                      3 CUTPRCE(1)             4 FILPRCE(1)            5 NERTH    (1)
       TMPL          4                0 IND      (1)           1 SWID     (1)          2 TWOCL    (1)
                                      3 JACK     (1)

STATISTICS
  PROGRAM LENGTH                   1047B     551
  CM LABELED COMMON LENGTH           57B      47
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      SUBROUTINE PREVEN2(TMO,STRT,NSTRT,DTOTAL,MMMM,TT,ITY)
      INTEGER    INDXRF(35)
      DIMENSION TOTAL(35)
      DIMENSION STRT(10),TMO(10,4)
      COMMON /NDXRF/ INDXRF
      COMMON /PRVNT1/ ISKIP
      COMMON /SCAN3/ JDL
      COMMON /TTL/TOTAL
      IF(ISKIP.EQ.1) GO TO 100
      DO  101  I=1,35
  101 INDXRF(I)=3
      KK=1
      MAXYR=JDL
      ICHECK=0
      TTSLCT=0.
      TTCRPT=0.
      TCLNDRN=0.
      TCLNSWP=0.
      TTOT=0.
      TDTOT=0.
      XREPAIR=0.
      XSLJNT=0.
      XRESLAB=0.
      XCLEAN=0.
      XDISTOT=0.
      XTOTAL=0.
      INDXRF(JDL)=2
      DO 502 J=1,NSTRT
  502 INDXRF(INT(STRT(J)+.01))=INT(TMO(J,1)+.01)
      I=1
      TRKK=TT
      IF(ITY.EQ.2) TRKK=0.
      IEND=0
      IF((ITY.EQ.1)                      ) GO TO 3702
 3699 IF((INDXRF(I).EQ.1)) GO TO 3701
 3700 I=I+1
      IF(I.GE.MAXYR) GOTO 3705
      L=I-1
      IF(INDXRF(L).EQ.1.OR.ITY.EQ.1)ICHECK=1
      IF(ICHECK.EQ.1.A.INDXRF(L).NE.3) TRKK=TRKK+TMO(KK,2)
      IF  (INDXRF(L).NE.3) KK=KK+1
      GOTO 3699
 3701 ISTART=IEND+1
      IEND=I
      CALL FLEX82(TTSLCT,TTCRPT,TCLNDRN,TCLNSWP,TTOT,TDTOT,
     *       MMMM,ISTART,IEND)
      GO TO 3703
 3702 IF(INDXRF(I).EQ.2)GO TO 3704
 3703 I=I+1
      IF(I.GE.MAXYR) GO TO 3706
      GOTO 3702
 3704 ISTART=IEND+1
      IEND=I
      CALL RIGI2(XREPAIR,XSLJNT,XRESLAB,XCLEAN,XDISTOT,XTOTAL, KK,
     *TRKK,MMMM ,ISTART,IEND,TMO)
      GO TO 3700
 3705 IF(IEND.EQ.MAXYR) GOTO 3707
```

```
SUBROUTINE PREVEN2    74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00         PAGE      2

                  GOTO 3701
             3706 IF(IEND.EQ.MAXYR) GOTO 3707
 60               GOTO 3704
             3707 TOTALS=TTOT+XTOTAL
                  DTOTAL=XDISTOT+TDTOT
                  WRITE(8,2700)MMMM,TOTALS,DTOTAL
             2700 FORMAT(/////,5X,*TOTAL MAINTENANCE COST OF THE STRATEGY*,I4,*  IS*
 65              .,2X,*$*,F10.0//,,5X,*TOTAL DISCOUNT MAINTENANCE COST OF THE SAME S
                 -TRATEGY IS  $*,F10.0///)
              100 CONTINUE
                  RETURN
                  END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
   4  PREVEN2         1           68

VARIABLES     SN   TYPE             RELOCATION
     0  DTOTAL    REAL                    F.P.          REFS       63    DEFINED          1        62
   320  I         INTEGER                               REFS       11         35         36        37         38        44        48
                                                          49       50         53    DEFINED        10         30        36        49
   323  ICHECK    INTEGER                               REFS       40    DEFINED         14        39
   342  IEND      INTEGER                               REFS       43         45         52        54         57        59
                                                     DEFINED       33         44         53
     0  INDXRF    INTEGER     ARRAY       NDXRF         REFS        2          5         35        39         40        41        48
                                                     DFFINED       11         27         29
     0  ISKIP     INTEGER                 PRVNT1        REFS        6          9
   344  ISTART    INTEGER                               REFS       45         54    DEFINED        43         52
     0  ITY       INTEGER                 F.P.          REFS       32         34         39   DEFINED          1
   340  J         INTEGER                               REFS     2*29    DEFINED         28
     0  JDL       INTEGER                 SCAN3         REFS        7         13         27
   321  KK        INTEGER                               REFS       40         41         54   DEFINED         12        41
   343  L         INTEGER                               REFS       39         40         41   DEFINED         38
   322  MAXYR     INTEGER                               REFS       37         50         57        59    DEFINED        13
     0  MMMM      INTEGER                 F.P.          REFS       45         54         63   DEFINED          1
     0  NSTRT     INTEGER                 F.P.          REFS       28    DEFINED          1
     0  STRT      REAL        ARRAY       F.P.          REFS        4         29    DEFINED         1
   326  TCLNDRN   REAL                                  REFS       45    DEFINED         17
   327  TCLNSWP   REAL                                  REFS       45    DEFINED         18
   331  TDTOT     REAL                                  REFS       45         62    DEFINED        20
     0  TMO       REAL        ARRAY       F.P.          REFS        4         29         40        54    DEFINED         1
     0  TOTAL     REAL        ARRAY       TTL           REFS        3          8
   345  TOTALS    REAL                                  REFS       63    DEFINED         61
   341  THKK      REAL                                  REFS       40         54    DEFINED        31         32        40
     0  TT        REAL                    F.P.          REFS       31    DEFINED          1
   325  TTCRPT    REAL                                  REFS       45    DEFINED         16
   330  TTOT      REAL                                  REFS       45         61    DEFINED        19
   324  TTSLCT    REAL                                  REFS       45    DEFINED         15
   335  XCLEAN    REAL                                  REFS       54    DEFINED         24
   336  XDISTOT   REAL                                  REFS       54         62    DEFINED        25
   332  XREPAIR   REAL                                  REFS       54    DEFINED         21
   334  XRESLAB   REAL                                  REFS       54    DEFINED         23
```

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      SUBROUTINE PREVEN2     74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00          PAGE      3

 VARIABLES       SN   TYPE                RELOCATION
   333  XSLJNT      REAL                                   REFS         54    DEFINED        22
   337  XTOTAL      REAL                                   REFS         54         61   DEFINED        26

 FILE NAMES           MODE
        TAPE8       FMT                          WRITES          63

 EXTERNALS                TYPE     ARGS          REFERENCES
         FLEX92                     9                45
         RIGI2                     12                54

 INLINE FUNCTIONS     TYPE     ARGS           DEF LINE   REFERENCES
        INT         INTEGER     1   INTRIN                   2*29

 STATEMENT LABELS                        DEF LINE    REFERENCES
   240   100                                67          9
     0   101                                11         10
     0   502                                29         28
   277   2700       FMT                     64         63
   116   3699                               35         42
   122   3700                               36         56
   160   3701                               43         35          58
   172   3702                               48         34          51
   175   3703                               49         47
   205   3704                               52         48          60
   220   3705                               57         37
   224   3706                               59         50
   230   3707                               61         57          59

 LOOPS   LABEL      INDEX       FROM-TO      LENGTH      PROPERTIES
    23   101        I            10 11          4B         INSTACK
    71   502        J            28 29          7B         INSTACK

 COMMON BLOCKS     LENGTH        MEMBERS - BIAS NAME(LENGTH)
         NDXRF         35                     0 INDXRF  (35)
         PRVNT1         1                     0 ISKIP   (1)
         SCAN3          1                     0 JDL     (1)
         TTL           35                     0 TOTAL   (35)

 STATISTICS
   PROGRAM LENGTH                       364B      244
   CM LABELED COMMON LENGTH             110B       72
```

```
SUBROUTINE FLEXB2     74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE     1

           SUBROUTINE FLEXB2(TTSLCT.TTCRPT.TCLNDRN.TCLNSWP.TTOT.TDTOT.
          *     MMMM. ISTART.IEND)
           REAL LDHR
           DIMENSION  REPFL(10.2).REPRG(10.2)
           DIMENSION TOTAL(35)
           DIMENSION            SITLE(8) . SLCOAT(35). CRKPTCH(35)
           INTEGER  FRSTSL.SEALYR(15) .INDXRF(35)
           DIMENSION    CCLNDRN(35).CCLNSWP(35)
           COMMON /ARBK/ AREA
           COMMON /DMBLK/ TRST
           COMMON /DOBK/ IDO.ITY
           COMMON /NDXRF/ INDXRF
           COMMON /PRVNT/ICYCLE.FACTR1.FACTR2.FACTR3.FRSTSL.COSTR.NRG.REPRG.
          * IRG.  CHSL.PTCH.CLNDRN.JCYCLE.CLNSWP.SLCT.COSTF.NFL.REPFL.IFL
          * .SCLPOP
           COMMON /RESTR/ IREST.JREST
           COMMON /SCAN3/ JDL
           COMMON /TTL/TOTAL
           COMMON /TYPBK/ LMH.LFUNC
      7800 FORMAT(1H1//)
      7875 FORMAT(50X.*MAINTENANCE COSTS STRATEGY*.I2//.53X.*(ASPHALTIC CONCR
          2ETE)*///.2X.*YR*.5X.*SURFACE      *.5X.*CRACKSEALING*.7X.*MAINTAIN*
          3.7X.*CLEANING*.2X. 3(5X.A11).4X.*TOTAL*/. 9X.*TREATMENT*.27X.*DRAI
          -NS*. 9X.*AND SWEEPING*. 3X.A11.5X.A11.5X.A11/)
           J=8
           JS=1
           LDHR=5.92
           UNLDHR=3.65
           SITLE(1)=11HPATCHING
           SITLE(2)=11HOTHER
           SITLF(3)=11HOTHER
           SITLE(4)=11H
           SITLE(5)=11HMAINTENANCE
           SITLE(6)=11HREPAIRS
           WRITE(J.7800)
       104 WRITE(J.7875)  MMMM.(SITLE(I).I=1.6)
           IJ=0
           ISTRT=ISTART
           JYR=ISTART-1
           IF (ISTART.NE.1) GOTO 16
           IF((ITY.EQ.1).OR.(IREST.EQ.2)) JYR=100
           IF(ITY.EQ.2)IJ=1
           IF(ITY.EQ.2)SEALYR(1)=FRSTSL
        16 INDXRF(JDL)=2
           I=ISTART-1
        17 I=I+1
        18 IYR=I
           IF (INDXRF(I).NE.3) JYR=I
           IF((IYR-JYR).GE.8)IJ=IJ+1
           IF((IYR-JYR).GE.8)SEALYR(IJ)=JYR+5
           IF((IYR-JYR).GE.8) I=JYR+5
           IF((IYR-JYR).GE.8) JYR=I
       302 SLCOAT(I)=0
           IF(I.LE.IEND) GOTO 17
            IF(IJ.LT.1) GOTO 1702
           DO 151 I=1.IJ
       151 SLCOAT(SEALYR(I))=SLCT  *AREA
```

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SUBROUTINE FLEXB2      74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00         PAGE     2

                 1702 DO 1701 I=ISTART,IEND
                      IF(INDXRF(I).NE.3)ISTRT=I
    60                CRKPTCH(I)=CRSL*AREA
                      TTSLCT=TTSLCT+SLCOAT(I)
                      TTCRPT=TTCRPT+CRKPTCH(I)
                      CCLNDRN(I)=0
                      L=I-ISTRT+1
    65                IF(L.EQ.(L/JCYCLE)*JCYCLE) CCLNDRN(I)=CLNDRN*AREA
                      IF(JDL-(L/JCYCLE)*JCYCLE.LE.JCYCLE/2)CCLNDRN(I)=0.
                      TCLNDRN=TCLNDRN+CCLNDRN(I)
                      CCLNSWP(I)=CLNSWP*AREA*L
                      TCLNSWP=TCLNSWP+CCLNSWP(I)
    70                FLXPAR=0
                      FLXMAN=0.
                      IF(L.EQ.(L/NFL)*NFL) FLXMAN=COSTF*AREA
                      IF(JS.GT.IFL) GO TO 1900
                      IF(INT(REPFL(JS,1)+.001).EQ.L) FLXPAR=REPFL(JS,2)
    75                IF(INT(REPFL(JS,1)+.001).EQ.L) JS=JS+1
                 1900  CONTINUE
                      PATCH=PTCH*AREA
                      TOT=SLCOAT(I)+CRKPTCH(I)+CCLNDRN(I)+CCLNSWP(I) +PATCH
                      TOT=TOT+FLXMAN+FLXPAR
    80                WRITE(8,1904) I,SLCOAT(I),CRKPTCH(I),CCLNDRN(I),CCLNSWP(I),PATCH,
                     *FLXMAN,FLXPAR,TOT
                      TOTAL(I)=TOT
                      TTOT=TTOT+TOT
                      DTOT=TOT/((1.+TRST)**I)
    85                TDTOT=TDTOT+DTOT
                 1701 CONTINUE
                 1901 FORMAT(I4,6(8X,F10.2))
                 1902 FORMAT(I4,7(7X,F10.2))
                 1903 FORMAT(I4,7(7X,F10.2))
    90           1904 FORMAT(I4,8(6X,F10.2))
                 1703 FORMAT(2X,*TOTALS*,4X,6(F10.0,8X) )
                      RETURN
                      END


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS      DEF LINE      REFERENCES
    4  FLEXB2          1          92

VARIABLES      SN  TYPE            RELOCATION
    0  AREA        REAL                  ARRK          REFS          9          57          60          65        68          72          77
  630  CCLNDRN     REAL          ARRAY                 REFS          8          67          78          80     DEFINED        63          65
                                                         66
  673  CCLNSWP     REAL          ARRAY                 REFS          8          69          78          80     DEFINED        68
   35  CLNDRN      REAL                  PRVNT         REFS         13          65
   40  CLNSWP      REAL                  PRVNT         REFS         13          68
   42  COSTF       REAL                  PRVNT         REFS         13          72
    5  COSTR       REAL                  PRVNT         REFS         13
  545  CRKPTCH     REAL          ARRAY                 REFS          6          62          78          80     DEFINED        60
   34  CRSL        REAL                  PRVNT         REFS         13          60
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          SUBROUTINE FLEXB2      74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00       PAGE     3

VARIABLES      SN  TYPE             RELOCATION
    472  DTOT       REAL                             REFS       85   DEFINED      84
      1  FACTR1     REAL                 PRVNT       REFS       13
      2  FACTR2     REAL                 PRVNT       REFS       13
      3  FACTR3     REAL                 PRVNT       REFS       13
    467  FLXMAN     REAL                             REFS       79      80   DEFINED      71       72
    466  FLXPAR     REAL                             REFS       79      80   DEFINED      70       74
      4  FRSTSL     INTEGER              PRVNT       REFS        7      13      43
    460  I          INTEGER                          REFS       36      46      47     2*48       52       53       54
                                                       57     2*59      60      61       62       63       64       65
                                                       66       67      68      69     4*78     5*80       82       84
                                                  DEFINED       36      45      46       51       56       58
      0  ICYCLE     INTEGER              PRVNT       REFS       13
      0  IDQ        INTEGER              DORK        REFS       11
      0  IEND       INTEGER               F.P.       REFS       54      58   DEFINED       1
     70  IFL        INTEGER              PRVNT       REFS       13      73
    461  IJ         INTEGER                          REFS       49      50      55      56   DEFINED       37       42
                                                       49
      0  INDXRF     INTEGER     ARRAY    NDXRF       REFS        7      12      48      59   DEFINED       44
      0  IREST      INTEGER              RESTR       REFS       16      41
     33  IRG        INTEGER              PRVNT       REFS       13
      0  ISTART     INTEGER               F.P.       REFS       38      39      40      45       58
                                                  DEFINED        1
    462  ISTRT      INTEGER                          REFS       64   DEFINED      38      59
      1  ITY        INTEGER              DORK        REFS       11      41      42      43
    464  IYR        INTEGER                          REFS       49      50      51      52   DEFINED       47
    455  J          INTEGER                       DEFINED       25   I/O REFS     35      36
     37  JCYCLE     INTEGER              PRVNT       REFS       13    2*65    3*66
      0  JDL        INTEGER              SCAN3       REFS       17      44      66
      1  JREST      INTEGER              RESTR       REFS       16
    456  JS         INTEGER                          REFS       73    2*74    2*75  DEFINED       26       75
    463  JYR        INTEGER                          REFS       49    2*50    2*51      52   DEFINED       39       41
                                                       48       52
    465  L          INTEGER                          REFS     2*65      66      68    2*72       74       75
                                                  DEFINED       64
    454  LDBR       REAL                             REFS        3   DEFINED      27
      1  LFUNC      INTEGER              TYPBK       REFS       19
      0  LMH        INTEGER              TYPBK       REFS       19
      0  MMMM       INTEGER               F.P.       REFS       36   DEFINED       1
     43  NFL        INTEGER              PRVNT       REFS       13    2*72
      6  NRG        INTEGER              PRVNT       REFS       13
    470  PATCH      REAL                             REFS       78      80   DEFINED      77
     35  PTCH       REAL                 PRVNT       REFS       13      77
     44  REPFL      REAL        ARRAY    PRVNT       REFS        4      13    2*74      75
      7  REPRG      REAL        ARRAY    PRVNT       REFS        4      13
     71  SCLPOP     REAL                 PRVNT       REFS       13
    611  SEALYR     INTEGER     ARRAY                REFS        7      57   DEFINED      43       50
    473  SITLE      REAL        ARRAY                REFS        6      36   DEFINED      29       30       31       32
                                                       33       34
    503  SLCOAT     REAL        ARRAY                REFS        6      61      78      80   DEFINED       53       57
     41  SLCT       REAL                 PRVNT       REFS       13      57
      0  TCLNDRN    REAL                  F.P.       REFS       67   DEFINED       1      67
      0  TCLNSWP    REAL                  F.P.       REFS       69   DEFINED       1      69
      0  TDTOT      REAL                  F.P.       REFS       85   DEFINED       1      85
    471  TOT        REAL                             REFS       79      80      82      83       84
                                                  DEFINED       78      79
      0  TOTAL      REAL        ARRAY    TTL         REFS        5      18   DEFINED      82
      0  TRST       REAL                 DMBLK       REFS       10      84
      SUBROUTINE FLEXB2      74/74    OPT=0 ROUND=*/ TRACE.              FTN 4.6+420        09/02/77  13.54.00       PAGE     4

VARIABLES       SN  TYPE             RELOCATION
    0  TTCRPT      REAL                   F.P.        REFS        62    DEFINED          1          62
    0  TTOT        REAL                   F.P.        REFS        83    DEFINED          1          83
    0  TTSLCT      REAL                   F.P.        REFS        61    DEFINED          1          61
  457  UNLDBR    * REAL                            DEFINED        28

FILE NAMES            MODE
       TAPE8       FMT                  WRITES        80
       VARIABLES USED AS FILE NAMES, SEE ABOVE

INLINE FUNCTIONS    TYPE    ARGS        DEF LINE  REFERENCES
       INT         INTEGER    1  INTRIN                74        75

STATEMENT LABELS                    DEF LINE   REFERENCES
   77  16                             44         40
  105  17                             46         54
    0  18            INACTIVE         47
    0  104           INACTIVE         36
    0  151                            57         56
    0  302           INACTIVE         53
    0  1701                           86         58
  161  1702                           58         55
  437  1703      FMT  NO REFS         91
  267  1900                           76         73
  423  1901      FMT  NO REFS         87
  426  1902      FMT  NO REFS         88
  431  1903      FMT  NO REFS         89
  434  1904      FMT                  90         80
  345  7800      FMT                  20         35
  347  7875      FMT                  21         36

LOOPS  LABEL      INDEX      FROM-TO     LENGTH     PROPERTIES
  152  151          I         56 57        6B        INSTACK
  163  1701      *  I         58 86      154B                  EXT REFS

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
       ARBK           1                 0 AREA    (1)
       DMBLK          1                 0 TRST    (1)
       DOBK           2                 0 IDQ     (1)                1 ITY     (1)
       NDXRF         35                 0 INDXRF  (35)
       PRVNT         58                 0 ICYCLE  (1)                1 FACTR1  (1)                2 FACTR2  (1)
                                        3 FACTR3  (1)                4 FRSTSL  (1)                5 COSTR   (1)
                                        6 NRG     (1)                7 REPRG   (20)              27 IRG     (1)
                                       28 CRSL    (1)               29 PTCH    (1)               30 CLNDRN  (1)
                                       31 JCYCLE  (1)               32 CLNSWP  (1)               33 SLCT    (1)
                                       34 COSTF   (1)               35 NFL     (1)               36 REPFL   (20)
                                       56 IFL     (1)               57 SCLPOP  (1)
       RESTR          2                 0 IREST   (1)                1 JREST   (1)
       SCAN3          1                 0 JDL     (1)
       TTL           35                 0 TOTAL   (35)
       TYPBK          2                 0 LMH     (1)                1 LFUNC   (1)

STATISTICS
  PROGRAM LENGTH                   760B     496
  CM LABELED COMMON LENGTH         211B     137
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      SUBROUTINE RIGI2(XREPAIR.XSLJNT,XRESLAB.XCLEAN,XDISTOT.XTOTAL,KK,
     *TRKK.MMMM, ISTART,IEND.TMO)
      DIMENSION  REPFL(10.2).REPRG(10.2)
      DIMENSION TOTAL(35)
      DIMENSION TITLE(8).PERCENT(25) .TMO(10.4) .INDXRF(35)
      COMMON /ARBK/ AREA
      COMMON /DMBLK/ TRST
      COMMON /NDXRF/ INDXRF
      COMMON /PRVNT/ICYCLE.FACTR1.FACTR2.FACTR3.FRSTSL.COSTR.NRG.REPRG,
     * IRG.  CRSL.PTCH.CLNDRN.JCYCLE,CLNSWP,SLCT.COSTF,NFL.REPFL,IFL
     * .SCLPOP
      COMMON /SCAN3/ JDL
      COMMON /TTL/TOTAL
      DATA (PERCENT(I).I=1,25)/0.0.0,.04,0..13,0..28,0, .31. 0, .51.
     $ 0. .99. 0. 1.16. 0. 1.41. 0. 1.21, 0, .88, 0, .41, 0 /
 7871 FORMAT(50X.*MAINTENANCE COSTS STRATEGY*.I2//.53X.*(PORTLAND CEMENT
     2 CONCRETE)*///.2X,*YR*,3X,*REPAIR SCALING  *,3X,*SEALING JOINTS*.
     3 4X.*REPLACEMENT*,7X.*CLEANING*,7X.3(A11.5X)     ,*TOTAL*/,7X,*AND
     4POPOUTS*.8X.*AND CRACKS*, 8X,*OF SLABS*,10X,*AND SWEEPING*,3X.3(
     5 A11.5X)/)
      J=8
      KS=1
      KK=1
      TITLE(1)=11HMAINTAIN
      TITLE(2)=11HOTHER
      TITLE(3)=11HOTHER
      TITLE(4)=11HDRAINS
      TITLE(5)=11HMAINTENANCE
      TITLE(6)=11HREPAIRS
      WRITE(J.7800)
 7800 FORMAT(1H1//)
204   WRITE(J.7871)  MMMM.(TITLE(I),I=1,6)
      ISTRT=ISTART
      WRITE(8.1234)
 1234 FORMAT(/)
      DO 7803 NA=ISTART,IEND
      IF(INDXRF(NA).NE.3) TRKK=TRKK+TMO(KK.2)
      IF(INDXRF(NA).NE.3) KK=KK+1
      IF(INDXRF(NA).NE.3)  ISTRT=NA
      NB=NA-ISTRT+1
      NC=NB-4
      REPAIR=0.
      IF(NC.GE.0) REPAIR=SCLPOP*(1.+NC/22.)*AREA
      SLJNT=0
      IFACT=NB/ICYCLE
      IF(NB.EQ.(IFACT*ICYCLE)) SLJNT=AREA *FACTR1
      RESLAB=FACTR3*TRKK*AREA*PERCENT(NB)*.01
      CLEAN=FACTR2*NB*AREA
      XREPAIR=XREPAIR+REPAIR
      XSLJNT=XSLJNT+SLJNT
      XRESLAB=XRESLAB+RESLAB
      XCLEAN=XCLEAN+CLEAN
      TOTAL(NA)=REPAIR+SLJNT+RESLAB+CLEAN
      DRAINS=0.
      IF(NB.EQ.(NB/JCYCLE)*JCYCLE)DRAINS=CLNDRN*AREA
      IF (JDL-NA.LE.JCYCLE/2) DRAINS=0.
      RIGMAN=0.
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SUBROUTINE RIGI2       74/74    OPT=0 ROUND=*/ TRACE            FTN 4.6+420        09/02/77  13.54.00        PAGE      2

                    IF(NB.EQ.(NB/NRG)*NRG)RIGMAN=COSTR*AREA
                    RIGPAR=0.
  60                IF(KS.GT.IRG) GOTO 1900
                    KREP=INT(REPRG(KS,1)+.001)
                    IF (KREP.EQ.NB) RIGPAR=REPRG(KS,2)
                    IF (KREP.EQ.NB) KS=KS+1
               1900 CONTINUE
  65                TOTAL(NA)=TOTAL(NA)+DRAINS+RIGMAN+RIGPAR
                     WRITE(8,7904)NA,REPAIR,SLJNT,RESLAB,CLEAN,DRAINS,RIGMAN,
                   * RIGPAR,TOTAL(NA)
                    XTOTAL=XTOTAL+TOTAL(NA)
                    DISTOT=TOTAL(NA)/(1.+TRST)**NA
  70                XDISTOT=XDISTOT+DISTOT
               7803 CONTINUE
              7901  FORMAT(I4,6(7X,F12.0))
              7902  FORMAT(I4,7(5X,F12.0))
              7903  FORMAT(I4,7(5X,F12.0))
  75           7904 FORMAT(I4,8(4X,F12.0))
               7802 FORMAT(I4,6(8X,F10.0))
                    RETURN
                    END


SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS       DEF LINE      REFERENCES
    4  RIGI2            1            77

VARIABLES      SN   TYPE                  RELOCATION
    0  AREA         REAL                     ARRK         REFS        6        43        46        47        48       55       58
  416  CLEAN        REAL                                  REFS       52        53        66   DEFINED        48
   35  CLNDRN       REAL                     PRVNT        REFS        9        55
   40  CLNSWP       REAL                     PRVNT        REFS        9
   42  COSTF        REAL                     PRVNT        REFS        9
    5  COSTR        REAL                     PRVNT        REFS        9        58
   34  CRSL         REAL                     PRVNT        REFS        9
  423  DISTOT       REAL                                  REFS       70   DEFINED        69
  417  DRAINS       REAL                                  REFS       65        66   DEFINED        54        55       56
    1  FACTR1       REAL                     PRVNT        REFS        9        46
    2  FACTR2       REAL                     PRVNT        REFS        9        48
    3  FACTR3       REAL                     PRVNT        REFS        9        47
    4  FRSTSL       REAL                     PRVNT        REFS        9
  405  I            INTEGER                               REFS       32   DEFINED        32
    0  ICYCLE       INTEGER                  PRVNT        REFS        9        45        46
    0  IEND         INTEGER                   F.P.        REFS       36   DEFINED         1
  414  IFACT        INTEGER                               REFS       46   DEFINED        45
   70  IFL          INTEGER                  PRVNT        REFS        9
    0  INDXRF       INTEGER        ARRAY     NDXRF        REFS        5         8        37        38        39
   33  IRG          INTEGER                  PRVNT        REFS        9        60
    0  ISTART       INTEGER                   F.P.        REFS       33        36   DEFINED         1
  406  ISTRT        INTEGER                               REFS       40   DEFINED        33        39
  403  J            INTEGER                            DEFINED       21  I/O REFS        30        32
   37  JCYCLE       INTEGER                  PRVNT        REFS        9      2*55        56
    0  JDL          INTEGER                  SCAN3        REFS       12        56
```

```
      SUBROUTINE RIGI2       74/74    OPT=0 ROUND=*/ TRACE              FTN 4.6+420         09/02/77  13.54.00        PAGE     3

VARIABLES   SN  TYPE            RELOCATION
     0 KK       INTEGER           F.P.         REFS       37       38  DEFINED        1       23       38
   422 KREP     INTEGER                        REFS       62       63  DEFINED       61
   404 KS       INTEGER                        REFS       60       61       62       63  DEFINED       22       63
     0 MMMM     INTEGER           F.P.         REFS       32  DEFINED        1
   407 NA       INTEGER                        REFS       37       38     2*39       40       53       56     2*65
                                               2*66       68     2*69  DEFINED       36
   410 NB       INTEGER                        REFS       41       45       46       47       48     2*55     2*58
                                                 62       63  DEFINED       40
   411 NC       INTEGER                        REFS     2*43  DEFINED       41
    43 NFL      INTEGER           PRVNT        REFS        9
     6 NRG      INTEGER           PRVNT        REFS        9     2*58
   434 PERCENT  REAL      ARRAY                REFS        5       47  DEFINED       14
    35 PTCH     REAL              PRVNT        REFS        9
   412 REPAIR   REAL                           REFS       49       53       66  DEFINED       42       43
    44 REPFL    REAL      ARRAY   PRVNT        REFS        3        9
     7 REPRG    REAL      ARRAY   PRVNT        REFS        3        9       61       62
   415 RESLAB   REAL                           REFS       51       53       66  DEFINED       47
   420 RIGMAN   REAL                           REFS       65       66  DEFINED       57       58
   421 RIGPAR   REAL                           REFS       65       66  DEFINED       59       62
    71 SCLPOP   REAL              PRVNT        REFS        9       43
    41 SLCT     REAL              PRVNT        REFS        9
   413 SLJNT    REAL                           REFS       50       53       66  DEFINED       44       46
   424 TITLE    REAL      ARRAY                REFS        5       32  DEFINED       24       25       26       27
                                                 28       29
     0 TMO      REAL      ARRAY   F.P.         REFS        5       37  DEFINED        1
     0 TOTAL    REAL      ARRAY   TTL          REFS        4       13       65       66       68       69
                                            DEFINED       53       65
     0 TRKK     REAL              F.P.         REFS       37       47  DEFINED        1       37
     0 TRST     REAL              DMALK        REFS        7       69
     0 XCLEAN   REAL              F.P.         REFS       52  DEFINED        1       52
     0 XDISTOT  REAL              F.P.         REFS       70  DEFINED        1       70
     0 XREPAIR  REAL              F.P.         REFS       49  DEFINED        1       49
     0 XRESLAB  REAL              F.P.         REFS       51  DEFINED        1       51
     0 XSLJNT   REAL              F.P.         REFS       50  DEFINED        1       50
     0 XTOTAL   REAL              F.P.         REFS       68  DEFINED        1       68

FILE NAMES        MODE
       TAPE8      FMT                   WRITES       34       66
       VARIABLES USED AS FILE NAMES. SEE ABOVE

INLINE FUNCTIONS   TYPE    ARGS        DEF LINE  REFERENCES
       INT         INTEGER    1  INTRIN                61

STATEMENT LABELS               DEF LINE   REFERENCES
     0 204           INACTIVE      32
   334 1234     FMT                35         34
   225 1900                        64         60
   322 7800     FMT                31         30
   366 7802     FMT  NO REFS       76
     0 7803                        71         36
   244 7871     FMT                16         32
   352 7901     FMT  NO REFS       72
   355 7902     FMT  NO REFS       73
   360 7903     FMT  NO REFS       74
   363 7904     FMT                75         66
```

```
        SUBROUTINE RIGI2       74/74   OPT=0 ROUND=*/ TRACE            FTN 4.6+420         09/02/77  13.54.00        PAGE     4

LOOPS  LABEL     INDEX       FROM-TO     LENGTH    PROPERTIES
   52  7803    * NA           36 71        204B               EXT REFS

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       APBK           1                   0 AREA    (1)
       OMBLK          1                   0 TRST    (1)
       NDXRF         35                   0 INDXRF  (35)
       PRVNT         58                   0 ICYCLE  (1)               1 FACTR1  (1)                2 FACTR2  (1)
                                          3 FACTR3  (1)               4 FRSTSL  (1)                5 COSTR   (1)
                                          6 NRG     (1)               7 REPRG   (20)              27 IRG     (1)
                                         28 CRSL    (1)              29 PTCH    (1)               30 CLNDRN  (1)
                                         31 JCYCLE  (1)              32 CLNSWP  (1)               33 SLCT    (1)
                                         34 COSTF   (1)              35 NFL     (1)               36 REPFL   (20)
                                         56 IFL     (1)              57 SCLPOP  (1)
       SCAN3          1                   0 JDL     (1)
       TTL           35                   0 TOTAL   (35)

STATISTICS
  PROGRAM LENGTH                    517B      335
  CM LABELED COMMON LENGTH          203B      131
```

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Lindow, Edward S

Systems approach to life cycle design of pavements. - Champaign, IL ; Construction Engineering Research Laboratory ; Springfield, VA ; available from National Technical Information Service , 1978.

3v. ; 27 cm (Technical report - Construction Engineering Research Laboratory ; M-253)

Contents. v. 1, LIFE2 user's manual. v.2, LIFE2 system documentation. v.3, LIFE2 program listing.

1. Pavements-design and construction. 2. Pavements. I. Title. II. Series. U. S. Construction Engineering Research Laboratory. Technical report ; M-253.

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